After the Flood Waters Receded: Assessing the Economic Impacts of San Francisquito Creek's February 1998 Flooding

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and the Santa Clara Valley Water District

by
Katherine Kao Cushing, Ph.D.

March 1999

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After the Flood Waters Receded: Assessing the Economic Impacts of San Francisquito Creek's February 1998 Flooding

Katherine Kao Cushing, Ph.D.
March 1999

EXECUTIVE SUMMARY

Late in the evening of February 2, 1998, in response to record rainfall, San Francisquito Creek breached its banks, inundating approximately 11,365 acres of land in the communities of Palo Alto, East Palo Alto and Menlo Park. This flooding was the most severe on record for the creek. The purpose of this investigation was to identify and quantify the main economic impacts of the flooding on residents, businesses and organizations, and municipalities in these three cities. Data for this research was gathered by means of extensive phone and mail surveys, interviews, and document review.

This study found that the total economic impact of the flooding, including both direct and indirect damages, was approximately $28 million. Residential damage, sustained primarily in Palo Alto, accounted for 91% of the total cost. Damage to municipalities and other assistance agencies accounted for 5% of the damages and businesses and organizations made up the remaining 4% of the total economic impact.

Approximately 1,700 households in the three municipalities were adversely impacted by the flooding—1,155 in Palo Alto, 533 in East Palo Alto, and seven in Menlo Park. Total residential economic impact was over $25.5 million, with over $23.7 million worth of damage occurring in Palo Alto, $1.75 million in East Palo Alto, and $85,000 in Menlo Park. Most of the residential impact, 89% of the total, was direct damage, meaning damage caused by flood waters entering a residence. The remaining 11% of the cost was indirect, such as expenditures for temporary housing or loss of pay due to having to take time off work for post-flood clean up. In addition, the flooding caused over 134,000 hours of inconvenience to residents, and many residents were forced to live in temporary housing while their homes were being repaired.

This investigation found that 62 active businesses and organizations were adversely affected by the flood event, with most of them concentrated in the East Palo Alto commercial district of Whiskey Gulch. Total business and organization damages were $1.1 million. East Palo Alto incurred 50% of these damages, Palo Alto 34%, and Stanford University 16%. In terms of significant non-economic impacts, the disaster caused 7,200 hours of inconvenience to business and organization staff.

The costs to the cities of Palo Alto, East Palo Alto, and Menlo Park, along with other agencies involved in the flood response and recovery effort, amounted to over $1.4 million. The City of Palo Alto had the most expenditures (60% of total); Spending in both East Palo Alto and Menlo Park made up about 20% of the total each. The majority of these costs went towards emergency response- and recovery-related activities, such as debris removal and emergency protective measures.

This study demonstrates that the economic impacts of flooding in a heavily populated urban area can be substantial. Even though the flood occurred in a small area of land and over a relatively short time period, the costs and inconveniences incurred by residents, businesses and municipalities were significant and will not soon be forgotten.

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SECTION 1

INTRODUCTION

The winter of 1997-98 and its associated El Niño storms brought record levels of rain to the San Francisco Bay area. This extended rainfall caused the flooding of San Francisquito Creek on February 2 and 3 of 1998. The flooding resulted in extensive damage to residences, businesses, and other organizations. In addition, local municipalities and other agencies involved in relief efforts incurred considerable expenses responding to flood emergencies and engaging in flood recovery activities. The creek flow was the highest ever recorded and the monetary damages were the most severe ever suffered by the affected communities.

The purpose of this investigation was to comprehensively identify and analyze the economic impacts of the flooding on the following key groups of stakeholders: residents, businesses and organizations (e.g. non-profit organizations, educational institutions), and municipalities. This research effort involved identifying the residential and business areas most significantly affected by the flooding; contacting residents and businesses believed to be affected by flooding; and determining the extent of economic impact utilizing various data collection methods, such as face-to-face interviews, phone interviews, and a mail survey. In addition, staff at the city governments of Palo Alto, East Palo Alto, and Menlo Park were interviewed to obtain information on city expenditures related to the flooding.

RESULTS SUMMARY

This investigation included estimating both direct and indirect damages caused by the flooding. Direct impacts are those that arise due to direct physical contact and action of flood waters, such as damage to housing, household assets, public buildings, and industrial and commercial establishments impacts. Indirect impacts are losses arising not from the flood itself, but from the effects of the flood disrupting normal social and economic life. Examples of indirect damages include emergency protective measures by municipal governments and the cost of establishing temporary shelter (Agarwal and Roy 1991:155).[1]

Based on extensive surveys conducted as part of this research, the total economic impact of the February 1998 flooding of San Francisquito Creek on residences, businesses and other organizations, and municipalities and other assistance agencies, was $28,119,000, or approximately $28.1 million. Residential damage, accounted for most of the impact at $25,544,000 (91% of total), while municipality and other assistance agencies and business and organization impacts accounted for 5% and 4% of the total economic impacts, respectively.

The vast majority of the residential economic impact (93% of total residential damage) occurred in Palo Alto, where an estimated 1,155 households incurred some kind of damage. A significantly smaller amount of damage occurred in East Palo Alto (533 residences and approximately $1.75 million in total damages), and a minimal percent of the total damage (0.33%) took place in Menlo Park. Approximately 89% of the total damage was considered direct (i.e., caused by flood waters) and 11% considered indirect (i.e., due to some other aspect of flooding).

Economic impacts to local commercial establishments and other organization amounted to approximately $1,136,000 worth of damage. Unlike the residential damage, which occurred primarily in Palo Alto, most of these damages occurred in E. Palo Alto (50% of total business and organization impact), with Palo Alto accounting for 33%, and the rest (17%) to Stanford University. This research shows that 76 built structures were affected by the flooding including 68 commercial businesses and buildings, seven non-profit organizations, and Stanford University.

Monetary impacts on municipalities and other assistance agencies totaled $1,439,000 dollars in total damages, 60% of which was spent by Palo Alto, with East Palo Alto and Menlo Park accounting for approximately 20% each. Known expenditures by other agencies amounted to about $22,000

According to this investigation, over 540 households in this area sustained flooding above the first floor elevation. Reported flood depths within homes were as high as 24 inches. More generally, study data shows that nearly 1,700 households incurred some kind of damage, including both direct and indirect impacts. Some homes in Palo Alto were particularly hard hit by the flood; over one quarter of the Palo Alto households that incurred damage and participated in this investigation incurred over $20,000 worth of damage, with an average damage amount of almost $62,000. Six households out of the 161 that participated in a detailed mail survey reported damage amounts exceeding $100,000, with average reported flood depths of 16.5 inches above the first floor elevation.

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[1] This investigation emphasizes those indirect losses that were realistically quantifiable (e.g., municipal expenditures on emergency response) and, if possible, monetizable (i.e., feasible to assign an approximate dollar value to the damage).

Besides the dollar value impact of the flooding, there were also significant non-economic impacts. In East Palo Alto and Palo Alto, approximately 500 people were evacuated and many were taken to nearby Red Cross Shelters. Residents whose homes were heavily damaged were forced to live in temporary housing while their homes were being repaired. On average, these households spent almost one and half months living outside their homes. Local businesses and non-profit organizations hit by the flooding lost business and had to close in order to clean up after the flood waters had receded. All in all, the flood caused an enormous amount of emotional distress and over 140,000 hours of inconvenience.

STUDY METHODOLOGY AND SCOPE

In order to comprehensively identify and gather information from residents, businesses and organizations, and municipalities, this study employed several different research methods. During the beginning stages of the study, exploratory research was conducted so that the results of previous related research could be brought to bear on this investigation. This involved conducting literature reviews and interviewing individuals knowledgeable of the flooding and the creek. Next, the investigation was divided into three sub-studies, one for residents, one for businesses and organizations, and one for municipalities and other assistance agencies. The research methods for the resident survey included both a phone and mail survey while the methodology for collecting data from businesses and organizations involved face-to-face interviews, a mail survey, and a phone survey. Collecting necessary data from the municipalities and other agencies required a series of interviews with key staff members. The details of the techniques used to implement each of the sub-studies are presented in appendices A, B, and C.

The focus of this investigation was the economic effects (direct and indirect) of general flooding caused by the overbanking of San Francisquito Creek. While data on significant non-economic impacts, such as hours of inconvenience, was also collected and analyzed, the primary goal of the study was to quantify the impacts of the flooding in monetary terms. The study was also bound geographically, highlighting the municipalities of Palo Alto, East Palo, and Menlo Park—the communities thought to be more severely impacted by the flooding. Moreover, only certain areas within these municipalities were included in the study area. These were areas thought to be affected by creek overbanking and they are discussed in more detail later in this section. Damage due to erosion and storm drain backup (i.e., localized flooding) was not included in the scope of this study. Finally the study emphasized local impacts, that is, the flood's effects on the governments, residents, businesses, and other organizations within Palo Alto, East Palo Alto, and Menlo Park.[2]

The following discussion provides useful background information on the San Francisquito Creek, including its general characteristics and history and the events surrounding the February 2 and 3 flooding.

HISTORY OF FLOODING

The San Francisquito Creek watershed encompasses an area of approximately 40 square miles and extends from the ridge of the Santa Cruz Mountains to the San Francisco Bay. The creek itself runs through five municipalities (Palo Alto, East Palo Alto, Menlo Park, Portola Valley, and Woodside) and two counties (Santa Clara and San Mateo). This region includes a wide variety of human land uses and natural habitats including homes, apartment complexes, commercial shopping centers, open space preserves, grazing land, and a biological preserve. In several places, the creek serves as the border between Palo Alto and Menlo Park, East Palo Alto and Menlo Park, and Palo Alto and East Palo Alto.

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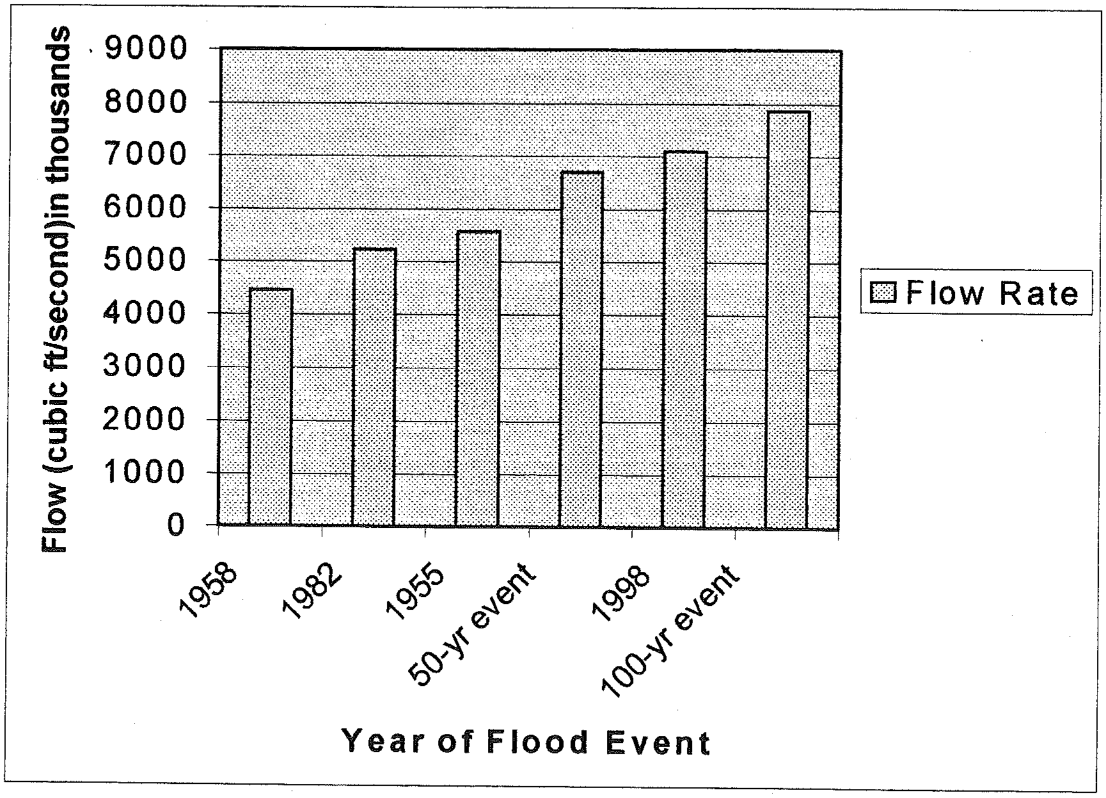
[2] This investigation does not include assessing the economic impact of Highway 101 and its associated on- and off-ramp closures due to the flooding.

Previous to the February 1998 flooding, the most significant flood on record for the creek occurred in December of 1955, with an estimated flow rate of 5,560 cubic feet per second (USGS records).[3] This flood was considered a 25-year event, meaning that in any given year, this type of event would have a 4% chance of occurring. The 1955 flood event inundated about 2,500 acres of commercial and residential property and approximately 70 acres of agricultural property (CRMP 1998). Also inundated were the Palo Alto airport and golf course. Damages were estimated at nearly $2 million (in 1956 dollars), which would be equivalent to approximately $10.4 million today. The creek also flooded in 1958 and 1982. Figure 1.1 below presents a comparison of the

Figure 1.1 History of Flooding in San Francisquito Creek



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[3] Factual information in this discussion comes from CRMP 1998.

creek's actual flow rates and estimations of 50-year and 100-year flood events. It shows that the 1998 flood was the most severe for San Francisquito Creek since record keeping began in 1931 with a flow rate of 7,100 cfs, 28% greater than the 1955 flood.

EVENTS SURROUNDING THE FEBRUARY 1998 FLOODING

The flooding of the creek surprised both the residents and city governments of Palo Alto, East Palo Alto and Menlo Park. Forced to handle an enormous amount of rainfall due to a severe weather front, the already full creek began to overflow. According to a Palo Alto City Manager's report:

> On Monday, February 2, a large and intense Pacific storm, driven by the El Niño weather system, struck the San Francisquito Creek watershed. Between 6:00AM on February 2 and 6:00AM on February 3, 4.5 inches of rain were measured at the Santa Clara Valley Water District precipitation gage in Palo Alto (above Foothills Park). Rainfall was particularly intense between 10:00PM and midnight. Because the ground had been saturated by a series of previous storms, even the undeveloped portions of the watershed were unable to absorb much of the rainfall. The result was increased runoff into local creeks and a heightened threat of flooding. The level of San Francisquito Creek rose precipitously between midnight and 1:00AM on February 3, resulting in flash flooding in Palo Alto, Menlo Park, and East Palo Alto (City of Palo Alto 1998a: 2).

According to reports from Public Works staff, the creek overtopped its banks in at least 15 locations, releasing flood waters into the three municipalities. The Santa Clara Valley Water District estimates that over 11,000 acres of land was inundated by the flooding. The most significant flooding resulted from the overtopping of the creek, although there were incidents of localized ponding (caused by storm drain backup) and basement flooding.

Figure 1.2 presents a map of the study boundaries, which represents the area affected by creek overbanking in the three municipalities. The map shows that the majority of the flooded area included in this study was in Palo Alto, with a small portion of the flooded area in East Palo Alto, and two very small areas in Menlo Park. Additionally, the figure shows that some locations in Palo Alto

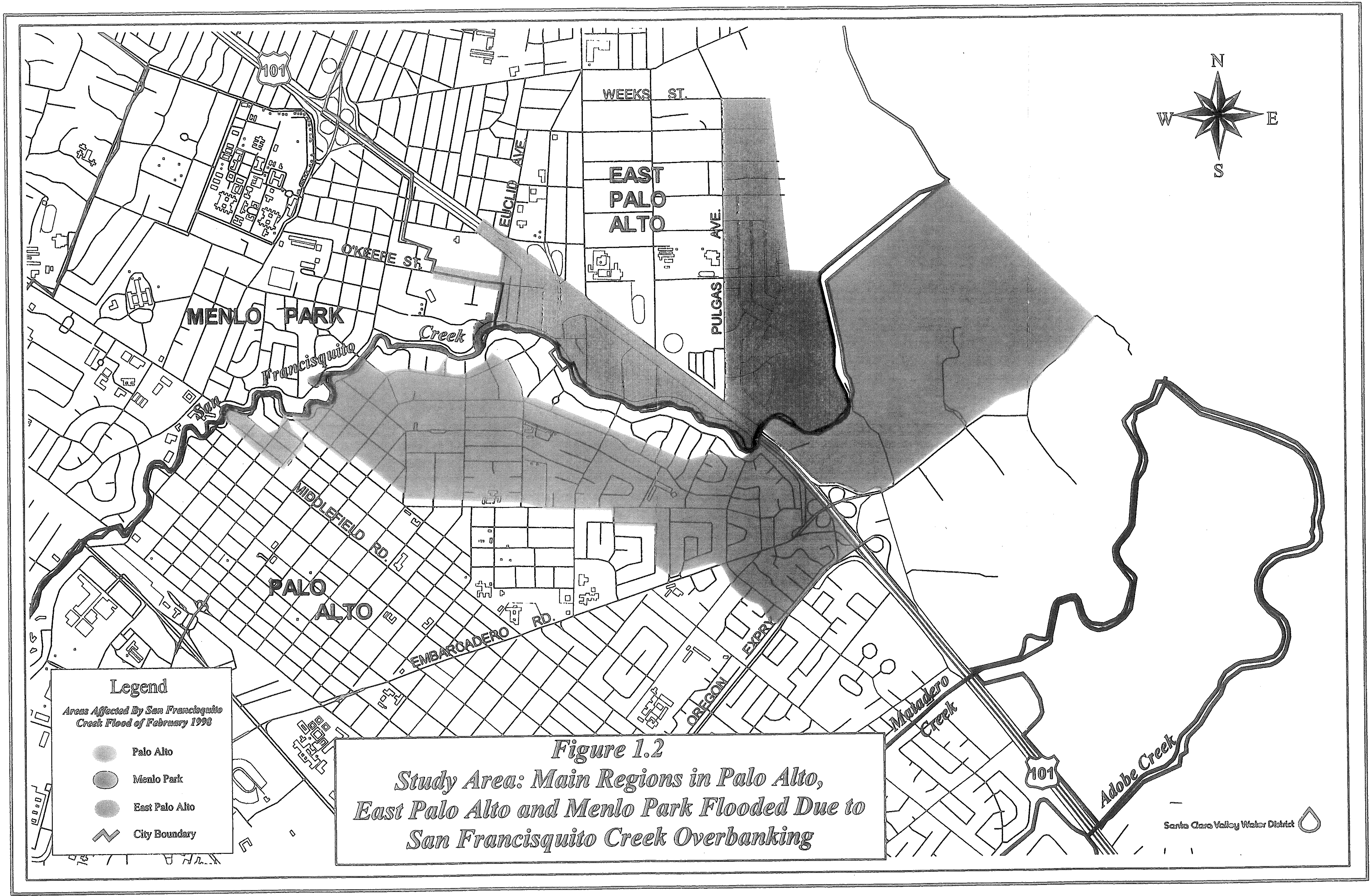

Figure 1.2

Study Area: Main Regions in Palo Alto, East Palo Alto and Menlo Park Flooded Due to San Francisquito Creek Overbanking

G:\gis\projects\102804\rq99_004\pa_fld98.apr immediately adjacent to the creek did not sustain flooding. This was because land bordering the creek in those areas naturally slopes away from the creek. Therefore, when the flooding took place, the flood waters flowed through those neighborhoods towards lower land elevations (City of Palo Alto 1998a:3).

REPORT ORGANIZATION

Section 2 of the report focuses on the economic impacts of the flooding on residential households in Palo Alto, East Palo Alto, and Menlo Park. This section includes structural damage, contents damage, vehicle damage, loss of income, and a variety of other costs associated with the flooding. Section 3 of the report discusses the flooding's economic impact on businesses and other organizations that were affected by the flooding. It examines what kinds of businesses losses were incurred as well as the various kinds of damage caused by flood waters, mud, and debris actually entering buildings. Section 4 of the report highlights the costs incurred by the city governments of Palo Alto, East Palo Alto, and Menlo Park due to the flooding, such as expenditures related to emergency response and debris removal. In addition, it discusses costs incurred by other agencies and organizations involved in the flood response and recovery efforts. Finally, Section 5 summarizes the studies findings in light of other related research and discusses the main contributions of the investigation.

SECTION 2

RESIDENTIAL ECONOMIC DAMAGES

The flooding of San Francisquito Creek came as an unwelcome surprise to many Palo Alto, East Palo Alto, and Menlo Park residents. According to personal accounts, some flood victims awoke in the early morning hours of February 3 to the sound of water rushing through their homes. The conditions in certain areas were so severe that victims had to flee their first floor apartments and bang on the doors of neighbors in second flood apartments to seek refuge. Some residents ultimately had to be rescued by boat. Several hundred residents were forced to stay in emergency shelters, and many residents whose homes suffered significant structural damage were forced to live in temporary housing, some for as long as a year after the flooding. The economic, as well as the emotional, hardships on residents who lived in the flooded area were severe and lasted long after the flood waters receded. This study estimates that the flooding affected almost 1,700 households, hitting the Palo Alto area particularly hard.

Photos of the flood's impacts taken by residents living in the St. Francis Neighborhood Association in Palo Alto are presented in Figures 2.1 to 2.4; they vividly illustrate the destruction and inconvenience caused by the flooding. Figure 2.1 was taken from a row boat on February 3, the day after the flood. It shows the two cars in the photo partially submerged. In fact, most of the cars on Sierra Court were severely damaged or destroyed beyond repair. Figure 2.2 is a photo depicting damage to the interior flooring of another home on Sierra Court. Figure 2.3 shows standing water inside one resident's home the day after the flood. The large amount of debris generated by flood clean up is the subject of Figure 2.4 (this pile of debris eventually doubled in size before the flood cleanup was complete).

The principal aims of this portion of the study were to answer the following the key questions:

1. Approximately **how many** households were adversely affected by the flooding?
2. What was the estimated **economic impact** of the flooding (both direct and indirect)?
3. What were other **significant non-economic impacts** of the flooding (e.g., hours of inconvenience)?

The discussion that follows summarizes the answers to these questions.

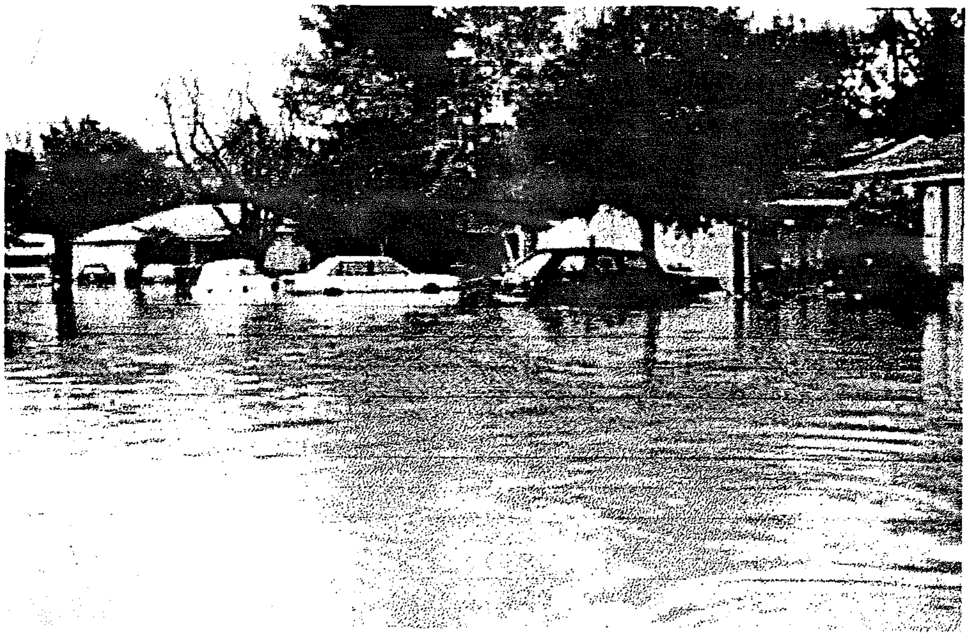

Figure 2.1 Cars Under Water: The View from Sierra Court
Photo courtesy of Edward and Gloria Murphy

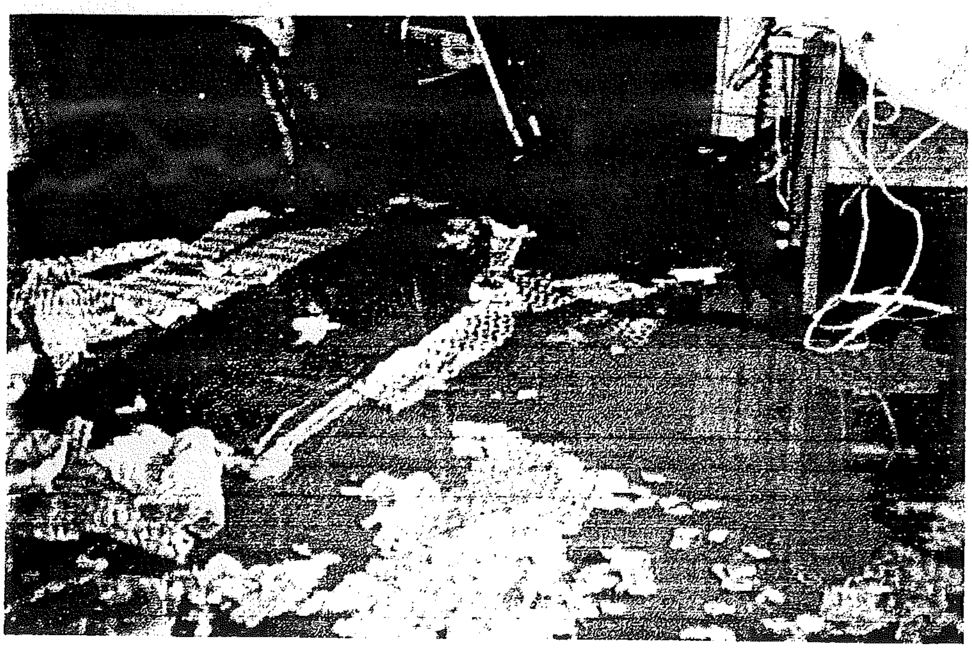

Figure 2.2 Damaged Interior Flooring and Computer Equipment
Photo courtesy of Alex Hunter and Eric Anderson

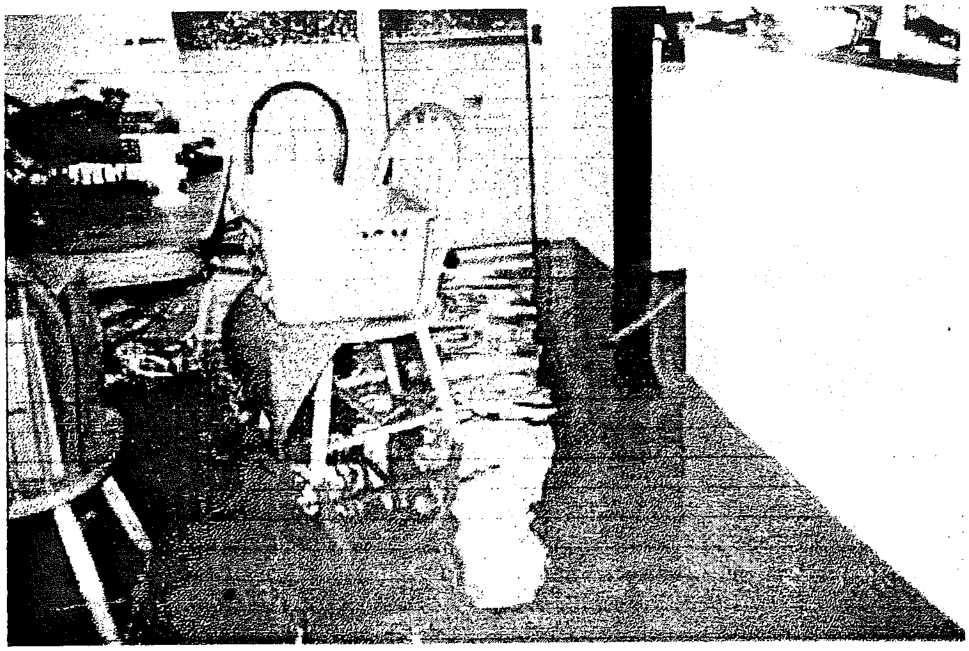

Figure 2.3 Standing Water in Resident's Home After Flooding
Photo courtesy of Edward and Gloria Murphy

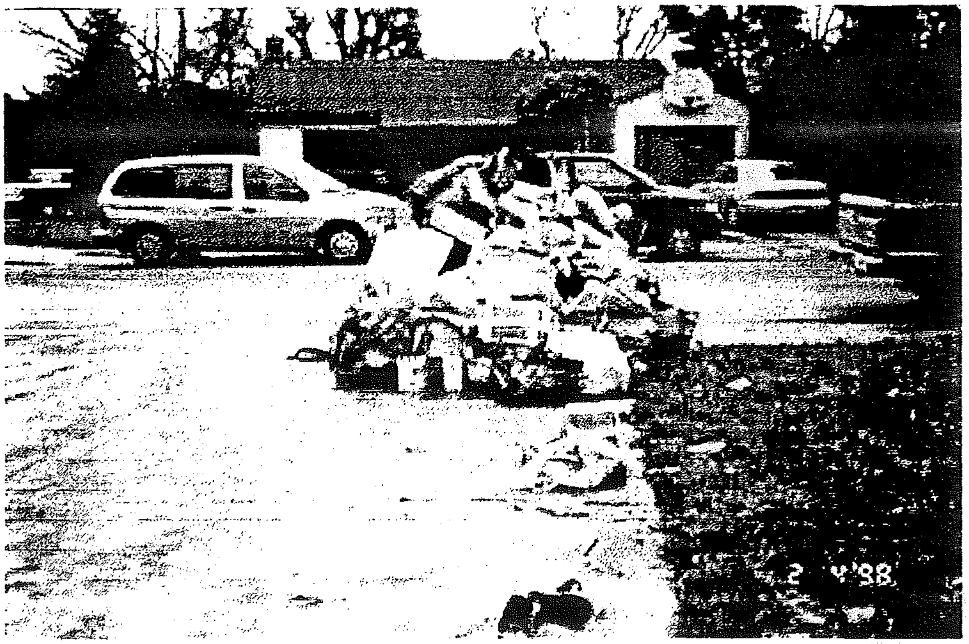

Figure 2.4 Post-Flood Clean Up Debris Pile
Photo courtesy of Alex Hunter and Eric Anderson

METHODOLOGY

Identifying and analyzing the economic impacts of the flooding on local residents involved conducting two types of surveys—phone and mail. For both the phone and mail surveys, questionnaire development, administration, and data analysis followed the general survey research methodology suggested by the Army Corps of Engineers (ACE 1991). This methodology consists of the following general steps:[1]

1) Defining study objectives
2) Selecting the survey method(s)
3) Designing the questionnaires
4) Pre-testing the questionnaires and procedures
5) Selecting a sample
6) Selecting and training personnel to administer phone questionnaire
7) Collecting data
8) Assessing non-responses
9) Coding, entering, and editing data
10) Analyzing data
11) Report writing

Appendix A provides details on the implementation of each of the above steps and supporting data collection documents.

LEVEL OF IMPACT

Data collected for this investigation indicate that approximately 1,700 households in Palo Alto, East Palo Alto, and Menlo Park were adversely affected by the February 2 and 3 flooding of San Francisquito Creek. This estimate is based on the results of a telephone survey conducted in mid-November 1998.

From November 12 through November 15, 1998, 14 volunteers from the Santa Clara Valley Water District made over 2,300 calls to residents in Palo Alto, East Palo Alto, and Menlo Park in the flooded area. The calls were made on weekday evenings between 6:00PM and 9:00PM and during the day on the weekend. The total number of calling hours was 110. Table 2.1 presents data on the estimated number of households in the flooded area and the number of calls made to residents in each city.

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[1] Note: in the following discussion, the terms questionnaire and survey are used interchangeably

Table 2.1 Calls Made to Palo Alto, East Palo Alto, and Menlo Park Residents*

City	Number of Households Believed to be in Flooded Area	Number of Households with Contact Information**	Number of Calls Made
Palo Alto	2,027	1,101	1,381
E. Palo Alto	1,364	930	969
Menlo Park	20	8	10
TOTAL	3,411	2,039	2,360

* See Appendix A, Section A1 for further details on the data sources and methods used to conduct the phone survey.

** While every effort was made to obtain correct contact information for addresses in the flooded area, it was not possible to contact residents who had moved, changed their phone numbers recently, had unlisted phone numbers, or who did not list their address in the phone directory.

The purpose of the telephone call was to determine whether or not a particular resident had been impacted by the February 2 and 3 flooding of San Francisquito Creek. The volunteers screened the residents by asking each respondent a series of five questions concerning structural damage, contents damage, vehicle damage, temporary shelter, and loss of work. If a respondent answered affirmatively to any of the five questions he/she was asked to participate further in the study by completing a survey that would be mailed the following day.

Tables 2.2 and 2.3. present summary information on the phone survey results. In Table 2.2, data on response rates—the percentage of contacted residents who agreed to participate in the phone survey—is shown. Residents contacted in all three cities affected by the flood had a high response rate: 88% for Palo Alto, 75% for East Palo Alto, and 100% for Menlo Park.

Table 2.2 Phone Survey Response Rates

City	Number of Residents Contacted	Number of Contacted Residents Who Agreed to Participate	Response Rate (percent)
Palo Alto	550	486	88%
East Palo Alto	271	202	75%
Menlo Park	4	4	100%

More detailed information on the phone survey results is presented in Table 2.3, which provides data on the estimated number of households affected by the flooding. This table shows that, in total, approximately 1,700 households, or 3,980 people, were affected by the flooding. Most of the affected households were located in Palo Alto (68% of the total) and East Palo Alto (32% of the total), with only a few houses affected in Menlo Park.

For all three cities, 52% of respondents reported that they had been adversely impacted by the flooding in some way. The validity of this percentage can be evaluated by examining the study's sample size in relation to statistical criteria for accuracy. The sample size of this investigation was limited by the availability of phone bank volunteers and the monetary constraints of the study. However, with a sample size of 692 (sum of residents contacted for three cities who participated) and one respondent per household, there is a 95% certainty that the true proportion of households that incurred some kind of damage is within 7.5% of the estimated 52%. In other words, there is a 95% probability that the true proportion of households that incurred some kind of damage is between 48.1% and 55.9%.[2]

To estimate the economic impacts of the flooding on individual households, residents who agreed to participate in the telephone survey and were indeed affected in some way by the flooding were then asked if they would complete a written mail survey. They were told that their responses would be kept confidential and were asked to return the survey by November 24, 1998. Table 2.4 presents data on the response rates for the mail survey by city. The overall response rate for all three cities was 52%, which is considered good (Response rates of greater than 30% are considered acceptable by planners and other professionals that often use surveys to obtain public participation.).

Resident responses to the mail survey varied considerably among the cities. Palo Alto residents had the highest response rate (58%). The response rate for Menlo Park, was higher, percentage-wise (67%), but represented a population of only three households. The response rate for East Palo Alto was considerably lower, but still acceptable. Since many East Palo Alto residents rent, as opposed to own, their homes, it was considerably more difficult to identify East Palo Alto residents affected by the flooding. In Palo Alto, on the other hand, most of the residents affected by the flooding both owned and resided in their homes, which may explain the higher response rate for this group of residents.

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[2] For details on the calculations used to derive these figures, see Appendix A, Section A1.

Table 2.3 Number of Households Affected by Flooding

City	Number of Participating Households Affected by Flood	% Participating Households Affected by Flood	Estimated No. of Households Affected by Flood
Palo Alto	277	57	1,155
East Palo Alto	79	39	533
Menlo Park	3	75	7*
TOTAL NO. HOUSEHOLDS			1,691
POPULATION ESTIMATE**			3,890

* This estimate is derived from both the phone survey data presented in this table and supplementary information provided by the City of Menlo Park.

** Assumes average household size of 2.3 people/household (average as determined by mail survey results)

Table 2.4 Mail Survey Results

City	Number of Residents Sent Survey	Number of Residents who Completed and Returned Survey	Response Rate* (percent)
Palo Alto	277	161	58%
East Palo Alto	77	25**	32%
Menlo Park	3	2	67%
TOTAL	357	187	Average: 53%

* See Appendix A, Section A1. For further details on explanations for variation in response rate.

** Although 25 households completed and returned the survey, two of those households did not incur any damages due to the flooding.

ECONOMIC IMPACTS

For residents in Palo Alto, East Palo Alto, and Menlo Park, data from this study shows that total residential damage, both direct and indirect, was more than $25.5 million. As Table 2.4 illustrates, most of the damage (93% of the total) occurred in Palo Alto; 7% in East Palo Alto,[3] and only a fraction of a percent of the total damages were in Menlo Park. These findings are consistent with the study's estimates of the number of households adversely affected by the flood and the different types of residential structures (i.e., apartments versus single family homes) inhabited by flood victims.

Table 2.4 Estimated Residential Economic Impact of Flooding

	Palo Alto	**E. Palo Alto**	**Menlo Park**	**Total**
Direct Damage	$21,202,000	$1,524,000	$85,000	$22,811,000
Indirect Damage	$2,505,000	$228,000		$2,733,000
Total	**$23,707,000**	**$1,752,000**	**$85,000**	**$25,544,000**
% of Total by City	93%	7%	0.33%	

The specific categories of economic impacts examined in this study and the details of residential economic impacts in Palo Alto, East Palo Alto, and Menlo Park are discussed in the following sections.

Description of Damage Categories

In the context of this study, the term "direct damages" includes damage to a residence's permanent structures (e.g., walls, flooring), contents (e.g., clothing, books), vehicles (e.g., cars and motorcycles), and money expended on clean-up costs (e.g., amount paid for drying or cleaning contents damaged by flood waters). Table 2.5

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[3] Looking strictly at the damage amounts, it would seem that most of the damage occurred in Palo Alto. However, examining just this one variable does not tell the complete story. In East Palo, a municipality that has a significantly lower median household income than Palo Alto, there were also severe effects. So, while the average dollar amount of damage may appear low compared to Palo Alto, this impact was still significant to East Palo Alto residents who may not have been as able financially to recover from flood damage.

presents categories of structural damages that residents were asked about in the questionnaire and the other categories of direct damages included in this study.

Table 2.5 Structural and Other Direct Damage Categories

STRUCTURAL DAMAGE CATEGORIES

- Electrical work (e.g., sockets, wiring)
- Plumbing (e.g., water heater, tap water system)
- Mechanical (e.g., heat, air conditioning)
- Doors and windows
- Interior floors, carpets, and ceilings
- Foundation, footings, and crack repair
- Painting
- Built-in shelves and appliances
- Outbuildings, decks, fireplaces, and garages
- Outside property and landscaping

CONTENTS REPLACEMENT

CONTENTS REPAIR (E.G., CLEANING, DISINFECTING)

VEHICLE REPAIR OR REPLACEMENT

In addition to money spent replacing, repairing, and cleaning items directly damaged by the flood waters, many residents also incurred expenditures that were indirectly related to the flooding. For this study, the term indirect damages includes expenditures for temporary housing, moving furniture, storage, and any flood-related medical problems. Table 2.6 presents details on the specific categories of indirect damages included in this study. On the residential mail survey, respondents were asked a number of questions asking them to provide information on these kinds of damages. See Appendix A, Section A2 for the specific questions asked on the survey form.

Table 2.6 Indirect Damage Categories

- Costs for moving furniture and other belongings
- Costs for storing furniture and other belongings
- Vandalism, looting, and theft costs
- Flood-related medical problems
- Other flood-related costs
- Dollars in pay (including vacation pay) lost by wage earners
- Other transportation-related expenses (e.g., mass transit)

Economic Impact of Flooding on Palo Alto Residents

The February 1998 flooding of San Francisquito Creek was responsible for over $23 million in damages in Palo Alto alone—$21.2 million (89%) in direct damage, and $2.5 million (11%) in indirect damage. Tables 2.7 and 2.8 illustrate the distribution of direct and indirect damages for this city. It shows that two-thirds of the direct damage (66%) was structural. Costs for replacing residential contents damaged by the flood and vehicle damage each accounted for 14% of the total direct damages, while costs for contents repair (e.g., cleaning soiled clothing, washing down muddy furniture) accounted for six percent of the total direct damages.

Table 2.7 Direct Damage: Palo Alto Residents

Damage Category	Estimated Value of Damage ($)	% of Total
Structural	$13,977,000	66%
Contents-replace	$2,979,000	14%
Contents-repair	$1,234,000	6%
Vehicle	$3,012,000	14%
TOTAL	**$21,202,000**	**100%**

Most of the indirect economic damage was attributed to 'other' costs such as storage and flood-related medical expenses (39%). The second largest contributor in the

Table 2.8 Indirect Damage: Palo Alto Residents

Damage Category	Estimated Value of Damage ($)	% of Total
Other costs (e.g., storage)	$981,000	39%
Other travel costs	$241,000	10%
Temporary housing	$552,000	22%
Additional food	$19,000	1%
Lost wages	$712,000	28%
TOTAL	**$2,505,000**	**100%**

indirect damage category was lost wages (28%). According to this study's data, 575 households in Palo Alto lost income[4] because of the flooding. Many residents reported that they had to take time off to address flood damage to their homes immediately after the flooding. Temporary housing expenses accounted for 22% of the total indirect damages.

Distribution and Range of Damages

In total, 161 Palo Alto households returned completed mail surveys. From these responses, a scatter plot was created to analyze the distribution of residential flood damage. Figure 2.5 presents the scatter plot of total damages for Palo Alto respondents. It shows that the majority of the total damages incurred by residents was less than $20,000, with a few households having very high amounts of damage. In fact, most of the households (63%) that participated in the mail survey reported less than $10,000 in total damage, about 11% reported between $10,000 and $20,000 in total damage, and 22% of households reported incurring between $20,000 and $100,000 worth of damage. Four percent of the households that responded to the mail survey incurred very high levels of damage, exceeding $100,000. The range of damages was considerable, from basically nothing to almost $200,000. Some households, while impacted by the flooding, experienced

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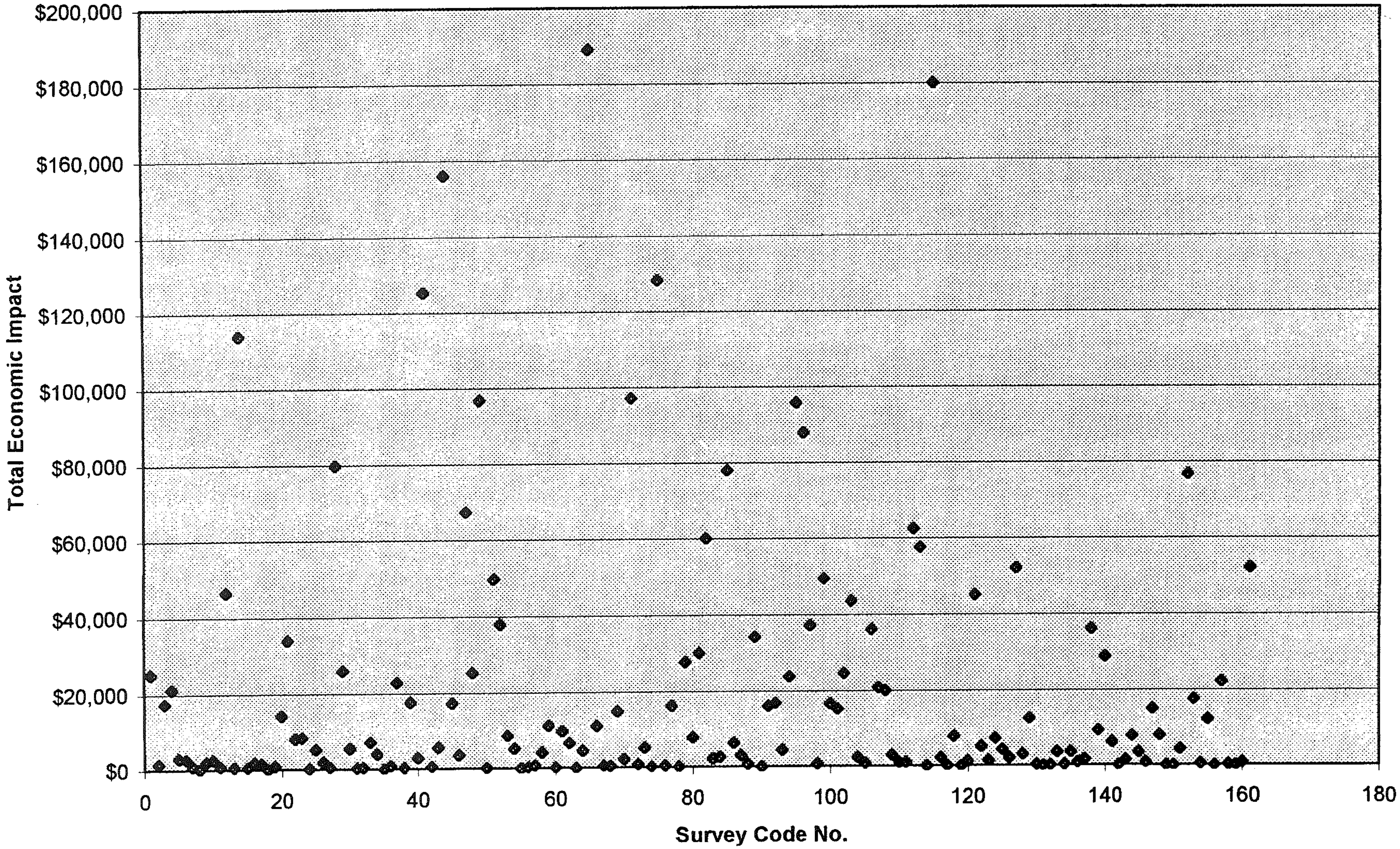
[4] The lost wage amount includes regular pay as well as the estimated value of vacation pay.

Figure 2.5 Scatter Plot of Total Economic Impact for Palo Alto Residents



negligible economic impacts (e.g., arriving late to work due to traffic or road closures), while others' homes were severely damaged, requiring major repair and reconstruction of permanent structures. In general, the affects of the flood were not evenly distributed. Figure 2.6 identifies the locations of households that reported sustaining $20,000 or more in total flood damage. The figure shows that houses in low lying areas, such as St. Francis Street, Walter Hayes Drive, and Sierra Court (where the flood waters tended to pool), suffered significantly greater damage than homes located on higher ground. For example, Table 2.9 below presents detailed information on the direct and indirect damages reported by a household on St. Francis that had over $90,000 in total damages.

Table 2.9 Example Household Damages for Heavily Damaged Home

DAMAGE CATEGORY	AMOUNT
Structural Damage	
Electrical	$2,000
Plumbing	$500
Mechanical	$2,000
Doors and windows	$200
Interior floors	$7,000
Foundation, footings	$1,800
Painting	$5,000
Built-in shelves and appliances	$1,000
Outbuildings, decks, etc.	$0
Outside property and landscaping	$500
Other (drying, disinfection)	$30,000
SUB-TOTAL	$50,000
Contents- replace	$9,500
Contents- repair	$0
Vehicle-repair/replace	$26,000
Other transportation-related expenses	$0
Temporary housing	$3,600
Additional food	$400
Lost income	$1,260
TOTAL	**$90,760**

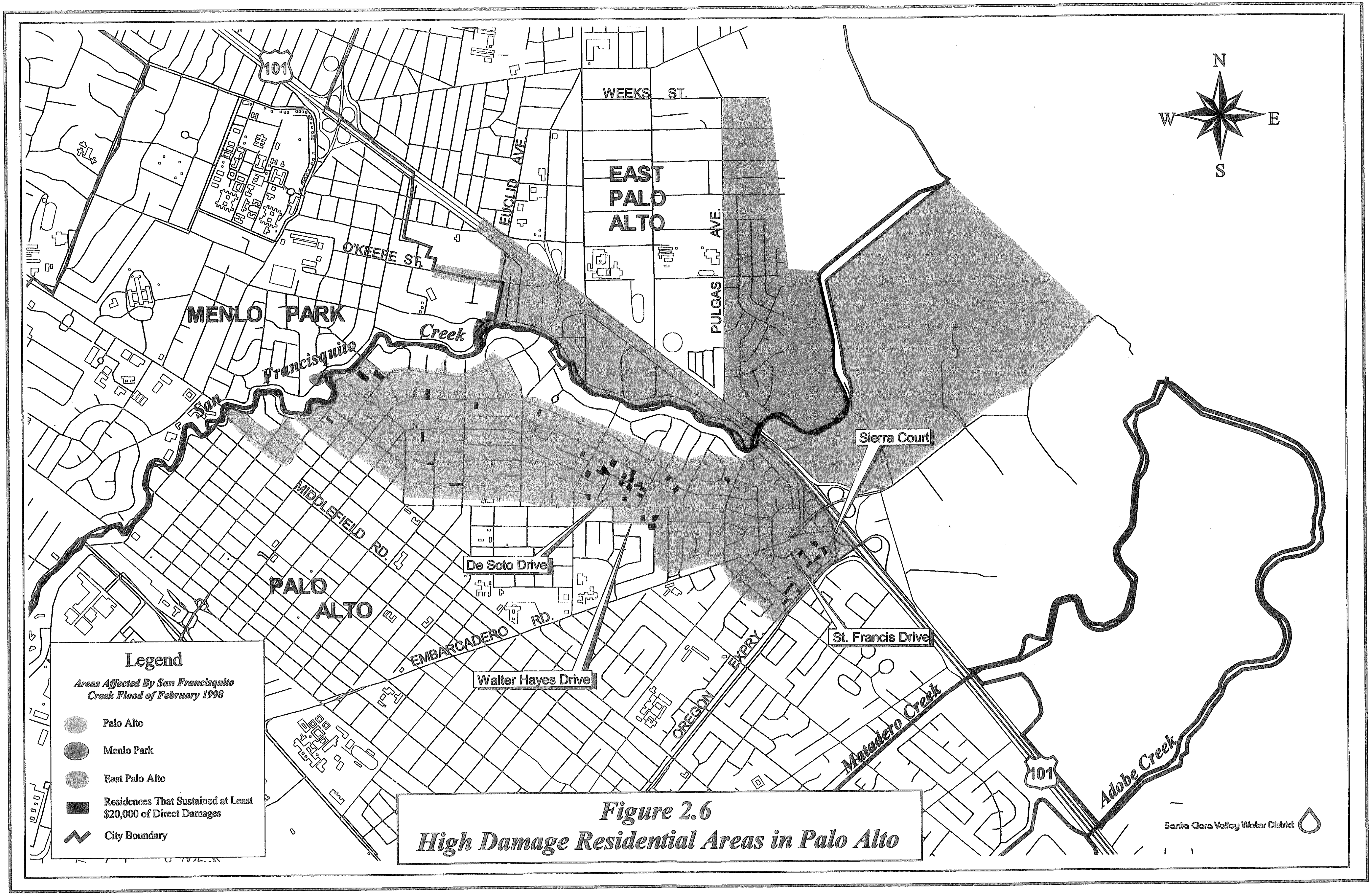


Figure 2.6
High Damage Residential Areas in Palo Alto

Economic Impact of Flooding on East Palo Alto Residents

This study's results indicate that approximately 533 households in East Palo Alto were affected by the flooding, and that the flood caused an estimated $1.75 million worth of direct and indirect damage. The cost distribution of the direct and indirect damage categories are presented in Tables 2.10 and 2.11. Direct damages accounted for 87% of East Palo Alto's total residential damage, while the remaining 13% of the damages were indirect.

Table 2.10 Direct Damage: East Palo Alto Residents

Damage Category	**Estimated Value of Damage ($)**	**% of Total**
Structural	$374,000	25%
Contents-replace	$265,000	17%
Contents-repair	$636,000	42%
Vehicle	$249,000	16%
TOTAL	**$1,524,000**	**100%**

Contents repair or replacement accounted for the majority of the direct damages in East Palo Alto. Together, these damage categories made up about 60% of the total direct damages. Since half of all the respondent households were tenants, this would explain why structural damage accounted for only 25% of the direct damages, since tenants are not responsible for repairing structural damage to residences. This percentage contrasts significantly with the percentage of total direct damages attributable to structural damage in Palo Alto (66%), where most survey respondents both owned and occupied their residences.

The major contributor to indirect damages in East Palo Alto was 'other' costs, which accounted for 39% of the total indirect damages. Lost wages and temporary housing costs, comprise the bulk of the remaining indirect damages, at 28% and 22%, respectively.

Table 2.11 Indirect Damage: East Palo Alto Residents

Damage Category	Estimated Dollar Value of Damage ($)	% of Total
Other costs (e.g., storage)	$34,000	15%
Other travel costs (e.g., public transit)	$7,000	3%
Temporary housing	$61,000	27%
Additional food	$14,000	6%
Lost wages	$112,000	49%
TOTAL	**$228,000**	**100%**

Economic Impact of Flooding on Menlo Park Residents

Since the number of homes in Menlo Park believed to be affected by the flooding was much less than in Palo Alto and East Palo Alto, a different set of techniques was used to assess economic impact on residents. In addition to the phone and mail survey conducted as part of this investigation, additional information was provided by the City of Menlo Park's Building Division. Soon after the flooding actually occurred, staff from the City's Building Division conducted a visual inspection of the flooded area and estimated probable damages. Together, these data sets were used to develop an estimation of the overall economic impact of the flooding on Menlo Park residential structures.

Based on data gathered from the phone and mail survey along with the City of Menlo Park data, it is estimated that seven homes were affected by creek overbanking and that damage was largely to personal property located in garages and landscaping in yards rather than structural damage to the residences. The approximate monetary value of costs to repair property damage to these homes (for structural and contents damage) is $85,000.

NON-ECONOMIC IMPACTS

In addition to the monetary impacts of the flooding, there were also significant non-economic impacts. Many flood victims were evacuated and moved to emergency shelters at the height of the flood; some residents having to be rescued by fire and police department staff. Residents with heavily damaged homes had to live in temporary housing, sometimes very far away from their residences, while their own homes were being repaired. Still others elected to live in their homes while they were being repaired, experiencing a myriad of inconveniences (e.g., no heat) due to construction.

Cleaning up after the flood was a time-consuming endeavor. Several of the questions on the mail survey asked residents about hours they spent addressing structural damage, replacing damaged contents, repairing and cleaning contents, time spent in emergency shelters, and any additional travel time. For Palo Alto, this study indicates that over 134,000 hours of time was spent by residents related to these aspects of the flood. To put this figure in perspective, that is the equivalent of 100 people spending five and a half months, eight hours a day, on flood recovery-related activities, time that could otherwise have been spent in more productive ways. For East Palo Alto, the total hours of inconvenience was 9,033, or the equivalent of 100 people working 11 days at 8 hours a day on flood recovery-related activities.

Another significant effect of the flooding, not fully captured by dollar figures was the inconvenience resulting from living in temporary housing. Results from this study indicate that in Palo Alto, 25% of the households in the flooded area (almost 290 households) reported that they had to reside in some kind of temporary housing (e.g., friends' or relatives' homes, apartments, trailer homes) while their homes were being repaired. Analysis of responses to the mail survey show that the average stay in temporary housing was 43 days, or almost one and half months. A significant percentage (17%) of households that reported living in temporary housing were out of their own homes for more than three months. One respondent even commented that his family would not be able to move back into their house until almost a year after the flood occurred. In East Palo Alto, 22% of respondents to the mail survey indicated that they were forced to live in temporary housing due to the flood. However, in contrast to Palo Alto residents, the average duration of their stays, eight days, was considerably shorter.

Personal accounts from mail survey respondents provide some more "human" perspective on the flooding. One resident, whose home was severely impacted by the flooding made the following statement about the serious emotional and physical affects of the flood:

“The stress put on our family, especially on our two-year old daughter, is something you just never imagine. We still have neighbors who are not in their houses, and my daughter asks about them every day . . . . My daughter has had . . . a respiratory infection which her doctor attributed to the flooding. For months we did not know if her health would be affected long term.”

Another resident’s comments echoed similar concerns.

“The fear and uncertainty of evacuating on foot in the middle of the night with two small children in waist high water . . . cannot be captured in this form [the survey]. I still have bad dreams about the ordeal.”

SECTION 3

BUSINESS AND ORGANIZATION ECONOMIC IMPACTS

The February flooding of San Francisquito Creek had a major impact on businesses and other organizations located in the flooded area. Based on general information from staff at the Santa Clara Valley Water District, City of East Palo Alto, and City of Palo Alto who were knowledgeable of the flooded area, along with Red Cross Damage reports, several main areas were identified as containing businesses and other organizations that might have been impacted by the February 2 and 3 flooding. Two of the areas, the Edgewood Shopping Center and Embarcadero/Bayshore Road area are located in Palo Alto. The other area, Whiskey Gulch, is located in East Palo Alto. Figure 3.1 identifies each of these locations.

The largest flooded area on the map, which is located in the northeast portion of the flooded area is the Bayshore/Embarcadero Road region. The Palo Alto Airport and Municipal Golf Course are the businesses that occupy most of the space in that area. An auto body repair shop, garden supply store, auto upholstery store, and a federal post office were the other businesses impacted by the flooding in that area. The other main commercial location in Palo Alto affected by the flooding was the Edgewood Center, off Embarcadero Road near the Highway 101 on ramp, where nine businesses reported economic impacts. In East Palo Alto, the main commercial district area affected was Whiskey Gulch, whose area comprises the red rectangle within the East Palo Alto boundary in Figure 3.1. Whiskey Gulch is heavily concentrated with small businesses, and this investigation indicates that approximately 50 businesses and organizations in this area were adversely impacted by the flooding. Figures 3.2 through 3.5 present photos of these three areas. Figure 3.2 shows storefronts of some of the businesses located in the Whiskey Gulch area, and the Edgewood Shopping Center is presented in Figure 3.3. Finally, Figures 3.4 and 3.5 show two business establishments located in the Embarcadero/Bayshore Road area that were damaged by the flooding and the location of creek overbanking in that area.

In addition to these general areas, several apartment complexes located in the flooded area of East Palo Alto were also adversely impacted, as well as an elementary school and an apartment complex in Palo Alto. The Stanford University Golf Course,

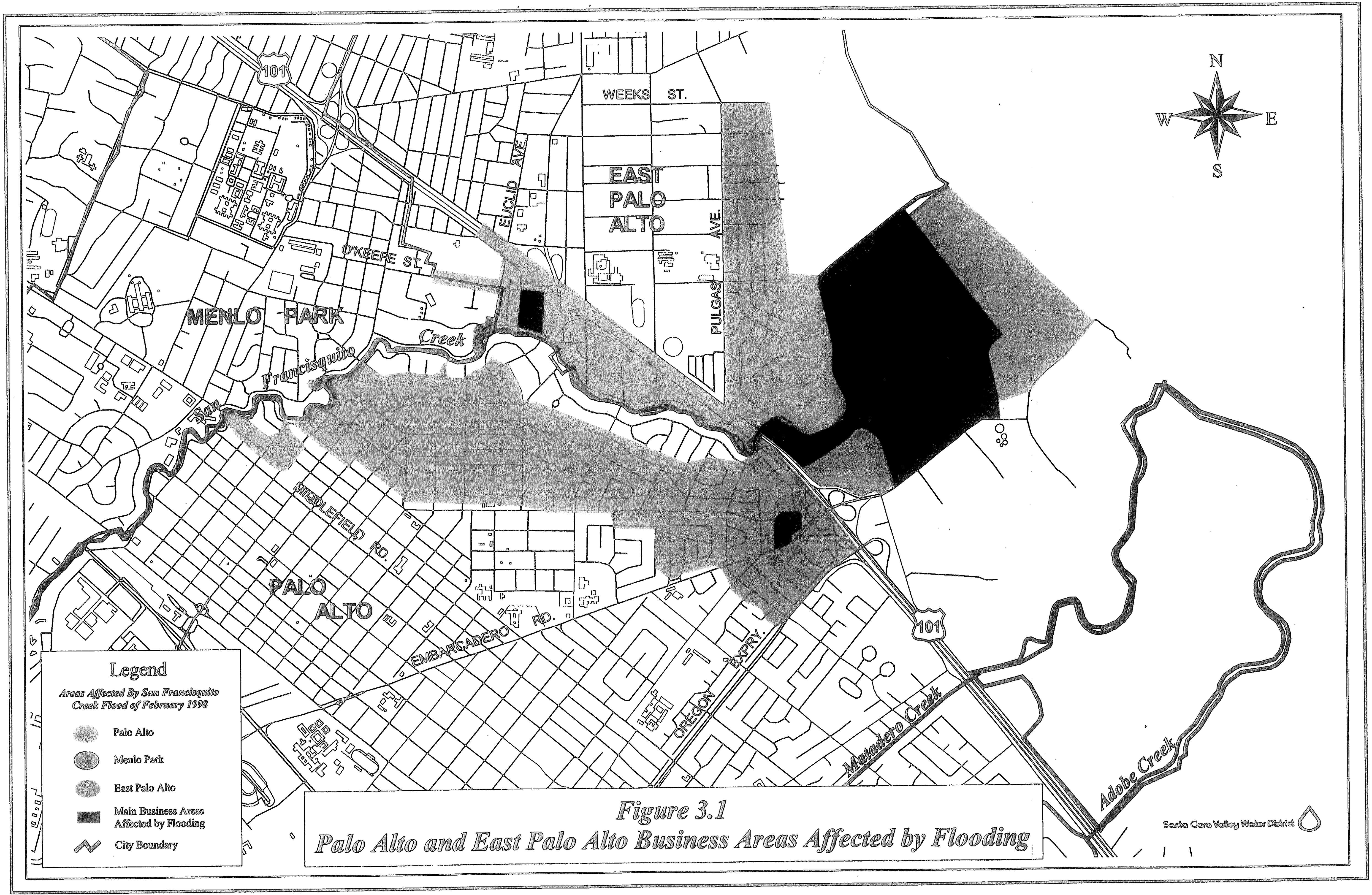


Figure 3.1
Palo Alto and East Palo Alto Business Areas Affected by Flooding

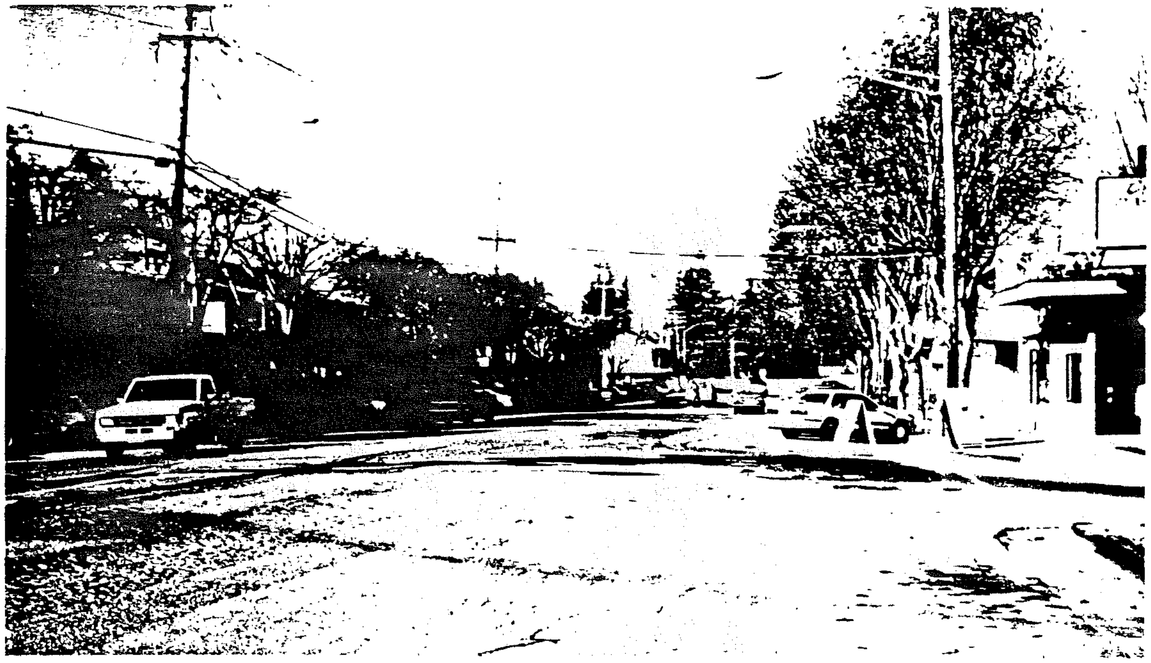


Figure 3.2 Businesses Affected by Flooding in Whiskey Gulch

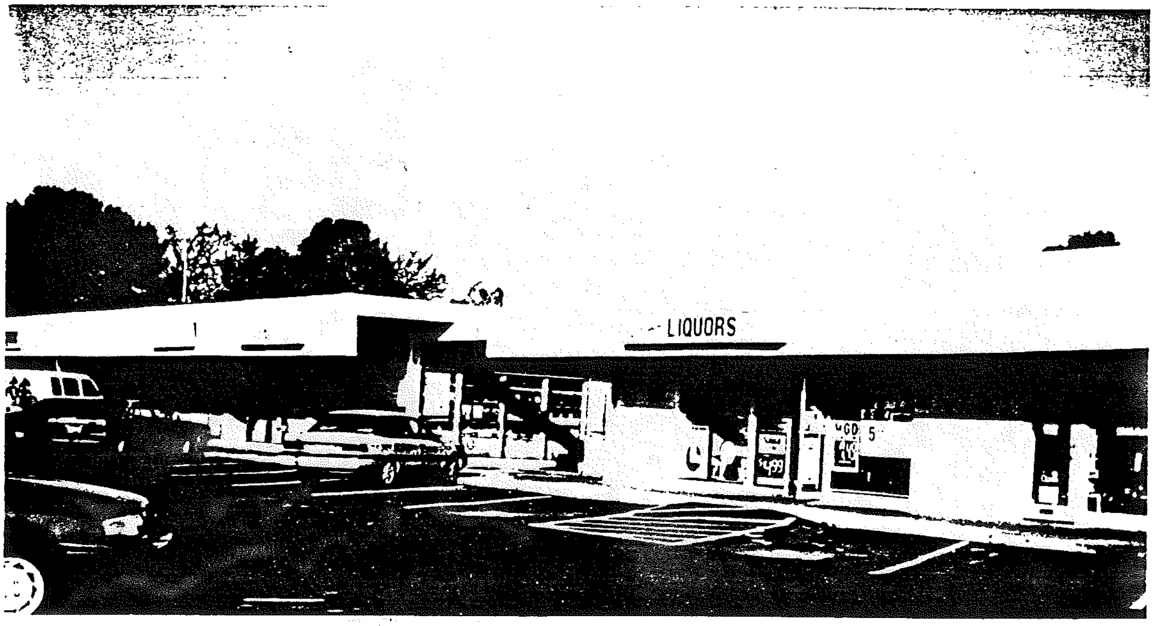


Figure 3.3 Edgewood Shopping Center Businesses

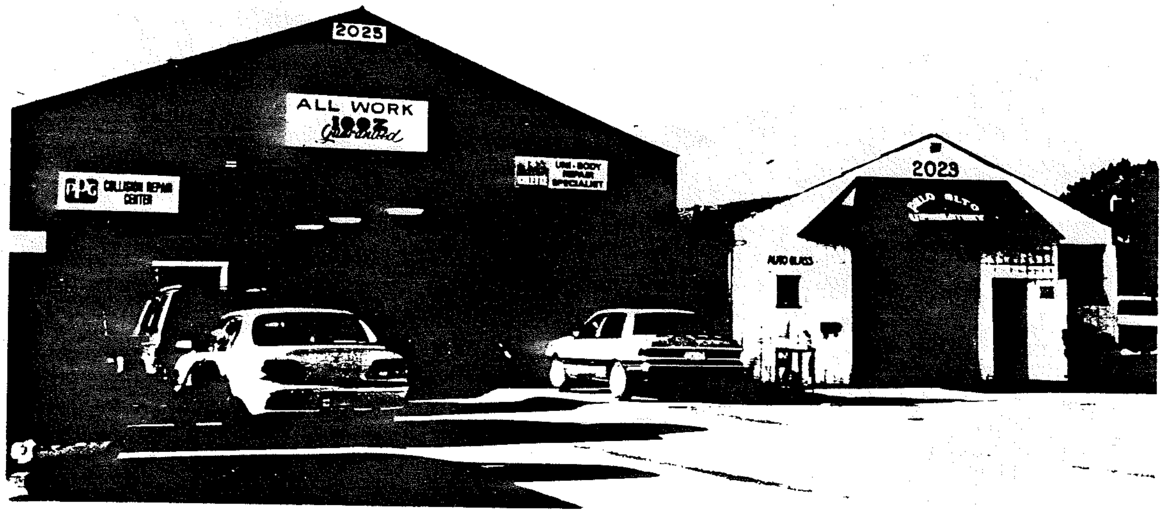


Figure 3.4 Businesses Affected by Flooding in Embarcadero/Bayshore Road Area

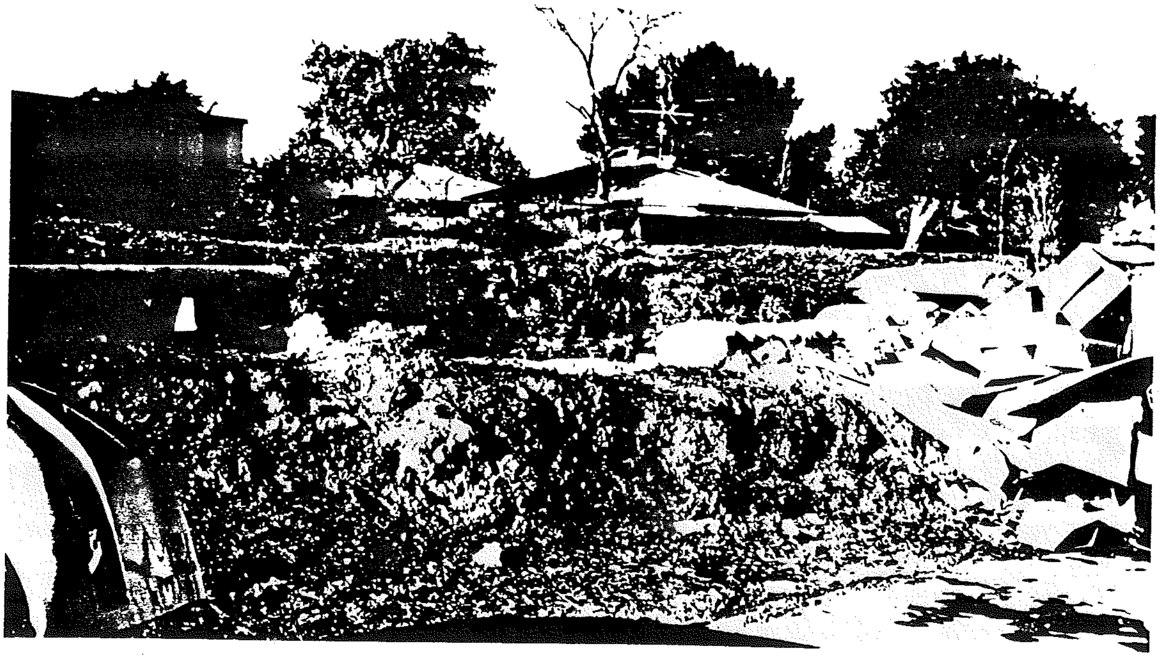


Figure 3.5 Location of Creek Overbanking in Embarcadero/Bayshore Road Area

located in unincorporated Santa Clara County on Stanford University land, was also damaged by the flooding.

The principal objectives of this portion of the study were to answer the following key questions:

1. Approximately **how many** businesses and organizations were adversely affected by the February flooding?
2. What was the estimated **economic impact** of the flooding (both direct and indirect)?
3. What were other **significant non-economic impacts** of the flooding?

The discussion that follows summarizes this investigation's answers to these questions.

METHODOLOGY

In order to more fully determine the nature and extent of flood-related damage to businesses and organizations, the following metholodology was used to gather data:

1. Identify geographic areas containing businesses or other organizations believed to be impacted by the flooding.
2. Canvass geographic area, interviewing staff to obtain: 1) general information on whether or not the flooding impacted the business/organization and the extent of the impact, 2) agreement from staff to participate in further data collection, 3) contact information (e.g., contact person, title, name of business/organization, mailing address, phone no.) for further data collection, and 4) physical observations of flood impacts on the buildings.
3. Prepare survey/questionnaire materials for businesses/organizations to fill out and return to principal investigator.
4. Assemble survey/questionnaire materials for businesses/organizations into distribution packets.
5. Distribute survey/questionnaire packets to businesses/organizations believed to be impacted by the flooding, either in person or by mail
6. Collect and analyze mail survey results
7. Follow-up with businesses/organizations that did not return mail survey/questionnaire by phone to obtain critical information.

Implementing this methodology employed several data collection methods including tours of the flooded area, physical inspections of buildings, face-to-face discussions with business and organization staff, written questionnaires, and phone interviews. Appendix B contains detailed information on the methodology and supporting data collection documents utilized to obtain this data.

IDENTIFICATION OF IMPACTED BUSINESSES AND ORGANIZATIONS

The results of this study indicate that approximately 76 structures containing various kinds of businesses and organizations were significantly affected by the February 2 and 3 flooding: 57 in East Palo Alto, 18 in Palo Alto, and one in Stanford. These businesses and organizations incurred both direct (i.e., caused by actual flood waters) and indirect (i.e., caused by some other factor related to the flooding) damages. Tables 3.1 and 3.2 below provides some general information about the location and nature of these businesses and organizations.

This investigation obtained flood damage-related information for 13 of the 18 (72%) businesses and organizations impacted in Palo Alto. Since data was collected for almost three quarters of the businesses and organizations believed to be significantly affected by the flooding, the representatives of the study's data is considered good.

The percentage of businesses and organizations that provided flood damage-related information for East Palo was less than that of Palo Alto, but still acceptable. In total, 25 of the 57 (44%) businesses and organizations impacted in East Palo Alto participated in the study by providing detailed written questionnaire or phone interview information. One quarter of these businesses and organizations (14 out of 57) were housed in what appeared to be abandoned facilities.

Significant efforts were made to maximize the response rate (i.e., the percentage of businesses/organizations that completed and returned surveys) of businesses and other organizations believed to be impacted by the flood. Specifically, businesses and organizations were personally visited by the principal investigator twice. First, to provide staff with general information about the purpose and nature of the research and to obtain preliminary agreement for their participation in the study. Second, to physically hand staff the survey materials and ask that they complete the survey and return it within seven days. Also, the survey packet materials (i.e., cover letter, survey, and flood damage worksheets) were translated into Spanish to facilitate the participation of businesses/organizations where Spanish was the primary language. Finally, the survey packet that participants were asked to complete included a postage paid envelope to facilitate return of the survey.

Table 3.1 Main Geographic Areas Affected By Flooding

City	**Area**	**Description of Business/Organization**	**Count**
East Palo Alto	Whiskey Gulch	Health and Beauty	4
		Restaurant/take out food	7
		Liquor	3
		Grocery/convenience store	3
		Non-profit	6
		Bar/nightclub	3
		Laundry/dry cleaning	2
		Other-merchant	5
		Other-service	3
		Empty/closed structures	14
		TOTAL	50
Palo Alto	Edgewood Shopping Center	Health and Beauty	1
		Restaurant	1
		Grocery	1
		Liquor	1
		Laundry/Dry cleaning	2
		Other-merchant	2
		Other-service	1
		TOTAL	9
Palo Alto	Embarcadero and Bayshore	Auto repair	2
		Garden supply	1
		Storage	1
		Post Office	1
		Golf course	1
		Aviation club	1
		TOTAL	7

Table 3.2 Other Organizations/Businesses Affected by the Flooding

City	Description of Business/Organization	Count
Palo Alto	Apartment complex	1
	School	1
	TOTAL	2
East Palo Alto	Apartment Complex	6
	Rental/repair company	1
	TOTAL	7
Stanford	Land Management Company	1

ECONOMIC IMPACT OF FLOODING

Based on survey data, the total economic impact of the February 2 and 3 flooding on East Palo Alto and Palo Alto businesses and organizations was $988,000 dollars. This amount includes non-recoverable business losses, structural damage, contents damage, vehicle damage, and other costs related to the flooding damage.

Table 3.3 below illustrates the breakdown of the economic impacts among East Palo Alto, Palo Alto, and Stanford. The most damage occurred in East Palo Alto, which accounts for about 50% of the total economic impact. Palo Alto businesses and organizations account for approximately 34% of the total impacts, and Stanford for 16%.

This value is considered conservative for several reasons. First, it does not account for damaged to "closed," or non-operational businesses such as the 14 unoccupied structures in East Palo Alto. Second, the calculations employed very conservative assumptions about business losses or damages for organizations and businesses that chose not to participate in the study or for which the project team was unable to obtain data (See Appendix B for details about methods used to estimate losses and damages). And finally, the total amount may have failed to include some businesses and organizations that were impacted by the flood, but not contacted as part of the study. For example, this amount does not account for structural or contents damage that occurred, but was not addressed by store or property owners (e.g., carpet that was ruined but not replaced). For these reasons, the actual economic impact of the flooding is most likely higher than the $988,000 estimate. Therefore, a more realistic estimate of total business and organization economic impacts is $1.136 million, 15% more than the $988,000.

Table 3.3 Cost Breakdown By Location

City	Damage Description	Amount
Palo Alto	Non-recoverable business losses	$117,000
	Business damage	$155,000
	Organization damage	$60,000
	SUBTOTAL	**$332,000**
East Palo Alto	Non-recoverable business losses	$36,000
	Business damage	$418,000
	Organization damage	$42,000
	SUBTOTAL	**$496,000**
Stanford	Organization damage	**$160,000**
	TOTAL	**$988,000**
	TOTAL PLUS 15%	**$1,136,000**

*Values rounded to the nearest $1,000

Description of Damage Categories

Non-recoverable business losses

In the context of this study, non-recoverable business losses refer to income or revenue permanently lost by businesses due to various aspects of the February 2 and 3 flooding. For example, many of the businesses in the Whiskey Gulch commercial district were forced to close for several days to remove mud, debris, and water from the interior of their buildings. Other business losses were caused by customers being unable to physically enter stores because of street or parking lot flooding. This was the case in the Edgewood Shopping Center of Palo Alto. Water did not physically enter these stores, but customers had no access to the stores due to parking lot flooding.

Non-recoverable losses differs from total business losses because, for total business losses, some monetary deficits can be made up for at a future time. For example, consider the East Palo Alto jewelry store that had to close for 3 days due to the flooding. The business loss for this store would be captured in part by a loss in total revenue (i.e., less cash register receipts at the end of the week). Some of this loss would be permanent because potential customers chose to go elsewhere to purchase jewelry. However, a portion of this loss is recoverable in the sense that customers who were unable to shop at the store during the week of the flooding postponed their shopping until later.

To account for the difference between total business losses and non-recoverable losses for businesses affected by phenomena such as floods and power outages, economists often assign percentages that represent the portion of businesses losses considered to be non-recoverable. The percentages vary according to the nature of the business, with businesses that deal with perishable goods (e.g., restaurants, grocery stores) or whose customers are heavily time-dependent (e.g., video rental stores) assigned higher percentages. Examples of percentages used to determine net business losses (i.e., total business loss multiplied by percentage of loss considered non-recoverable) for this study are presented in Table 3.4. These percentages are based on a previous related study conducted by the U.S. Army Corps of Engineers conducted in 1996 in Noyo Harbor, CA and the professional judgement of the San Francisquito Creek project team.

Table 3.4 Percentage of Business Loss Considered Non-recoverable

Business Description	**% Loss Non-recoverable**
Health and Beauty	50
Food-take out	75
Video rental	100
Bar/night club	100
Liquor	75
Convenience store	50
Grocery/produce	75
Jewelry	50

Data from this study shows that 26 businesses in East Palo Alto and 15 businesses in Palo Alto incurred from \$150,300 to \$172,800[1] in non-recoverable business losses.

Business Flood Damage

The term business flood damage in this investigation refers to the following categories of flood damage: 1) structural (i.e., damage to the building itself and items permanently attached to the building), 2) contents (i.e., items within building not permanently attached) , 3) vehicle (i.e., vehicles located on or near the business' property), and 4) other (e.g., cleaning, storage, and costs of paying employees for working on flood damage-related activities as opposed to business-related activities).

This study determined that 21 businesses in East Palo Alto and seven businesses in Palo Alto had \$572,400 to \$658,300[2] worth of business damage. Table 3 shows that most of the business damage (almost 73% of the total) occurred in East Palo Alto. The details of what businesses were impacted and the extent of the damage to these businesses is discussed later in the sections devoted to East Palo Alto and Palo Alto specifically.

Organization Damage

Several of the structures damaged by the flooding housed non-commercial organizations, such as a school, land owned by Stanford University, and non-profit organizations. The flood's impacts on these entities is captured by the category, 'organization damage.' This term includes the same categories of damage described in the business damage definition, that is structural, contents, vehicle, and other.

According to the study's results, eight organizations (six in East Palo Alto, one in Palo Alto, and one in Stanford) were impacted by the flooding, accounting for approximately \$262,000 worth of damage.

East Palo Alto Businesses and Organizations

Business Impact

The most significant economic impact of the February flooding in East Palo Alto was apartment complex damage. Several of the complexes in the flooded area had below grade garages that had to be pumped, and flood water also entered many apartments. Out of 20 apartment complexes contacted that were located in the study area, staff representing six complexes reported that their businesses suffered adverse economic impacts. One corporation that owns four major apartment complexes in East Palo Alto reported that its flood recovery-related costs were approximately \$300,000, which accounted for more than 70% of the flooding's total economic impact for the city. This

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[1] The \$172,800 figure represents the original estimated amount plus 15%.
[2] The \$658,300 figure represents the original estimated amount plus 15%.

amount included damage to 80 residential units, and covered expenses for structural damage (e.g., interior carpeting and pads), cleanup and repair, contents replacement (e.g., appliances), and lost rent (Peralta, 5 January 1999).

The Whiskey Gulch area of East Palo Alto contained the largest number (50) of businesses and organizations impacted by the flooding (two-thirds of the total). The types of businesses and organizations in this district included beauty supply salons and supply stores, grocery and liquor stores, restaurants, and several non-profit organizations. Flood waters from creek overbanking near the intersection of University Avenue and Woodland physically entered many of the buildings in this area, reaching as high as 4 inches above first floor elevation at their peak, according to some staff interviewed for the study. Most businesses were closed at least one day and some for as long as five days. Moreover, staff reported cleaning up flood-related damage long after the flood waters had physically receded. Some staff interviewed were still cleaning up 11 months after the actual flood.

The main economic impacts of the flooding on businesses in Whiskey Gulch were clean up costs, contents damage, and lost business. Most businesses had to close because of the flooding but still had to pay their employees to help them with clean up. Recovery efforts and repairs focused on addressing damage caused by water, mud, and other debris physically entering building structures. In one liquor store that had a basement the flood water rose as high as 5 feet.

The range of estimated business losses was large, from $300 to almost $70,000. Most (17) of the smaller businesses located in Whiskey Gulch reported losses of less than $5,000. The businesses with the greatest losses were the apartment complexes and one East Palo Alto business located on Bayshore Road that reported incurring almost $70,000 worth of damage (not including business losses).

Organization Impact

In East Palo Alto, several non-profit organizations were significantly impacted by the flooding. In one organization located near Highway 101, the water was as high as 4 inches above the first floor elevation. This organization lost approximately $8,300 worth of donations, including a pizza oven and 3 computers. It also had to spend approximately $3,000 to repair structural damage, including replacing plumbing, wallpaper, and sheetrock. Another non-profit organization that provides computer and internet access to the East Palo Alto community lost $30,000 worth of computer and computer-related equipment. Since these non-profits rely primarily on donations, the effect of the flood on these kinds of organizations was severe because of the uncertainty involved in replacing contents damaged by the flood with future donations.

Total Impact

Table 3.5 presents summary information on the economic impact of the flooding on individual businesses and organizations in East Palo Alto. It shows that the majority of the economic impact fell on local businesses (over 91%), and that most of the impact on the businesses was due to flood damage (92% of total business impacts), as opposed to non-recoverable business losses (8%).

Table 3.5 Economic Impact on East Palo Alto Businesses and Organizations

Category	Description	Net Business Loss*	Flood Damage	Total Impact
Business	1 Health and Beauty	$250	$500	$750
	2 Food-take out	$375	$500	$875
	3 Real Estate	$0	$500	$500
	4 Liquor store	$1,050	$500	$1,550
	5 Health and Beauty	$250	$500	$750
	6 Bar/Night club	$4,000	$650	$4,650
	7 Bar/Night club	$4,000	$650	$4,650
	8 Bar/Night club	$4,000	$650	$4,650
	9 Liquor store	$1,350	$6,800	$8,150
	10 Food-take out	$375	$500	$875
	11 Auto Car Wash	$100	$0	$100
	12 Convenience store	$250	$0	$250
	13 Coin-op Laundromat	$100	$0	$100
	14 Food-take out	$250	$500	$750
	15 Liquor store	$750	$11,800	$12,550
	16 Grocery	$1,500	$500	$2,000
	17 Hardware	$1,250	$2,900	$4,150
	18 Jewelry	$250	$0	$250
	19 Music	$10,000	$10,000	$20,000
	20 Food-take out	$375	$0	$375
	21 Health and Beauty	$250	$2,500	$2,750
	22 Food-take out	$250	$0	$250
	23 Health and Beauty	$250	$0	$250
	24 Video	$500	$0	$500
	25 Other-service	$250	$0	$250
	26 Food-take out	$3,000	$900	$3,900
	27 Liquor store	$750	$0	$750
	28 Other-service	$0	$66,960	$66,960
	29 Apartment complex	$0	$300,000	$300,000
	33 Apartment complex	$0	$5,000	$5,000
	34 Apartment complex	$0	$5,000	$5,000
	SUBTOTAL	**$35,725**	**$417,810**	**$453,535**
Org.	1 Non-profit	NAP	$2,000	$2,000
	2 Non-profit	NAP	$200	$200
	3 Non-profit	NAP	$30,000	$30,000
	4 Non-profit	NAP	$0	$0
	5 Non-profit	NAP	$9,300	$9,300
	6 Non-profit	NAP	NA	NA
	SUBTOTAL		**$41,500**	**$41,500**
	TOTAL	**$35,725**	**$459,310**	**$495,035**

* See Appendix C for details on calculations used to calculate net business loss
NAP = Not Applicable

Palo Alto Businesses and Organizations

The E. Bayshore Road/Embarcadero area contained businesses positioned very close to San Francisquito Creek. They are geographically more spread out and physically larger than businesses in the Edgewood Shopping Center area. Affected businesses in this area included a federal post office, the Palo Alto airport, Palo Alto Golf Course, an auto repair shop, and a garden supply store. These businesses were more significantly impacted by the flooding than those in the Edgewood Shopping Center, because flood waters entered the buildings' physical structures. According to one business owner, the flood waters reached almost two feet in height at their peak. The auto repair shop and garden supply store were the most severely harmed, as their buildings are adjacent to the creek. Several businesses in this area close for five days to clean up after the flood. The main impacts of the flooding on these establishments were clean up costs, contents damage, and lost business. The three businesses closest to the creek incurred an average of approximately $27,400 worth of damage and $11,700 worth of business losses each.

The flooding hit one apartment complex in Palo Alto particularly hard. Water flowed into several of its apartments, causing over $21,000 worth of structural damage and almost $12,000 worth of contents damage. In addition, the apartment complex owners spent over $3,500 removing debris and damaged items from the property and paying for trash dumpsters.

The Edgewood Shopping Center area housed a variety of commercial establishments including a large grocery store, shoe repair shop, delicatessen, clothing store, gas station, and dry cleaners. While no water physically came into any of these businesses, the parking lot surrounding the shopping center area was flooded, making many of the businesses inaccessible to staff and customers. In addition, the Embarcadero Road-Highway 101 junction was closed for several hours on February 3, further impeding access to the businesses. As the manager for a gas station located near the freeway on ramp put it, "All our business comes from freeway traffic. When people couldn't get on or off the freeway, they didn't stop and buy gas." The businesses impacted by the flooding in this area reported that they had to close for ½ to 1 day. The main impact of the flooding on these businesses was loss of revenue. Estimates of business losses ranged from less than $100 to $1,500.

The Duveneck Elementary School was the only organization significantly impacted by the flooding in Palo Alto. The entire school was closed on February 3. Six classrooms were severely damaged by the flooding and were uninhabitable for several days after the flooding. Structural damage, contents replacement, and clean up costs added up to $60,000, with approximately $46,000 in damage to floors and floor coverings, $10,000 in debris removal, cleaning, and disinfection costs, and $4,000 in contents damage (Lavagnino, 20 January 1999).

Table 3.6 below presents summary information on the economic impact of the flooding on individual businesses and organizations in Palo Alto. Similar to East Palo Alto, most of the economic impact of the flooding was borne by local businesses (82%).

Table 3.6 Economic Impact on Palo Alto Businesses and Organizations

Category	Description	Net Business Loss*	Flood Damage	Total Impact
Business	1 Gas station	$500	$0	$500
	2 Coin-op Laundromat	$75	$0	$75
	3 Clothing	$100	$0	$100
	4 Liquor store	$113	$0	$113
	5 Shoe repair	$750	$0	$750
	6 Health and Beauty	$350	$0	$350
	7 Deli	$150	$0	$150
	8 Grocery	$1,500	$0	$1,500
	9 Post Office	$7,500	$0	$7,500
	10 Auto repair	$10,000	$23,300	$33,300
	11 Auto repair	$15,000	$30,000	$45,000
	12 Garden supply	$10,000	$28,810	$38,810
	13 other-service	$500	$0	$500
	14 Storage	$2,000	$10,000	$12,000
	15 Golf Course	$68,000	$500	$68,500
	16 Apartment	$0	$36,957	$36,957
	17 Airport	$0	$25,000	$25,000
	SUBTOTAL	$116,538	$154,567	$271,105
Org.**	1 Elementary school	NAP	$60,000	$60,000
	TOTAL	**$116,538**	**$214,567**	**$331,105**

* See Appendix C, Table C2 for details on calculations used to determine estimated net business loss

** See Appendix C, Table C4 for details on organizational damage

NAP = Not Applicable

However, in contrast to East Palo Alto, losses were more evenly distributed between flood damage (57%) and non-recoverable business losses (43%).

Damage to Stanford

The Stanford Management Company estimated it cost $160,000 to address damage caused by the February 2 and 3 flooding. Most of the damage occurred in the area of the Stanford University Golf Course where the creek runs through the course. Flood damage repair activities centered primarily on removing fallen trees and other debris from the course. The other $25,000 in damages was for clearing debris from San Francisquito Creek and one of its main tributaries.

NON-ECONOMIC IMPACTS

Many organizations and businesses spent hundreds to thousands of hours cleaning up and replacing items damaged by the February flooding. Data from this study indicate that 21 businesses and organizations reported spending a total of 7,222 person-hours (2,408 person-days) clearing mud, water, and debris from their buildings, filing insurance claims, and addressing other flood-related issues. This amount of time is equivalent to 100 people working full time on flood-related activities for 24 days, demonstrating that the effects of the flood went on long after the actual flood waters actually receded.

Another important non-economic impact of the flooding not captured by the quantitative portion of this study is the impact of damage that occurred, but was not addressed. Many businesses in the Whiskey Gulch area are small owner-operator businesses and reported that they did not have sufficient funds to repair structural damage caused by the flooding. In at least three of the Whiskey Gulch businesses impacted by the flood, damaged carpets had been pulled out, but not replaced. One store owner, instead of replacing her carpet, sprinkled baking soda on the soiled carpet, waited for the moisture to be absorbed, and then vacuumed up the baking soda. She repeated this process numerous times over the month of February until the carpet was sufficiently dry. In several of the non-profit organizations affected by the flood in East Palo Alto, many volunteers offered their own time and supplies to help organizations respond to the flood.

Particularly for the non-profit organizations, the economic impact of the flooding is difficult to fully ascertain.

Many business and organization staff described their flood experience as extremely unpleasant. Impacts such as these are partially captured by the following personal accounts of the disaster by business and organization staff:

In one non-profit organization, the flooding caused a backup in the plumbing. According to a staff member, "Everything was overflowing, muddy water was coming out of the toilet!" She also reported that "Water coming out the pipes and faucets was a funny color and it smelled bad. We couldn't drink it, we had to boil all the water if we wanted to use it."

Several business owners had to spend the evening of February 2 responding to flood emergencies. One of the Palo Alto business owners whose building bordered the creek had to spend the night safeguarding his business from damage as the flood waters entered and flowed through his building. He and a neighboring business used a back hoe and the help of their employees to build a makeshift retaining wall in an unsuccessful attempt to hold back the flood waters.

One business owner in East Palo Alto was not aware of the flooding that had occurred in the wee hours of the morning on February 3. She opened her store to find the carpet covered with a layer of mud and had to spend the next two days with her husband and son removing the mud and excess water from the inside of her store. According to the store owner, cleanup was quite messy. "Mud had coated the floor and entered some low drawers. It was difficult to get it all out. It took about two days using a broom to push out the dirt."

SECTION 4

ECONOMIC IMPACTS ON MUNICIPALITIES AND OTHER AGENCIES

Besides residents, businesses, and other organizations, the February flooding of San Francisquito Creek also affected the city governments of Palo Alto, East Palo Alto, and Menlo Park. The three municipalities activated Emergency Operations Centers to respond to flood emergencies. Emergency response crews worked through the night to rescue people stranded in their homes and cars; public safety staff worked overtime to evacuate residents from flooded homes and streets; and city crews hauled debris and mud from city streets and worked to repair public facilities damaged by the flooding.

This investigation determined from official records and reports that the flood cost cities and other agencies involved in flood response $1,439,000. The City of Palo Alto was the most significantly affected, spending a total of over $839,000 (58% of total) on activities related to creek overbanking. The City of East Palo Alto incurred approximately $290,000 (20% of total) in overbank-related damages, and the City of Menlo Park reported $288,000 (20% of total) in similar flood damages. Other local agencies and relief organizations involved in flood response were the Santa Clara Valley Water District, which spent $22,000 on flood-related activities, and the local chapters of the Red Cross.[1] The focus of this portion of the study was to identify and assess impacts incurred primarily by the municipalities.

METHODOLOGY

Identifying and analyzing the economic impacts of the flooding on municipalities and other agencies and organizations involved conducting interviews with key city, agency, and organization staff, collecting relevant documents, and analyzing those documents for useful information. Interviews (including both phone and face-to-face) were conducted primarily with staff from public works departments, finance and accounting departments, and planning departments. The general methodology used to gather data for this portion of the study consisted of the following general steps:

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[1] Due to the record keeping procedures of the Red Cross at the local, regional, and national levels, it was infeasible to determine specifically the economic value of Red Cross activities devoted to assisting flood victims. General information about the Red Cross' activities in the study area and regional expenses are discussed later in this section of the report.

- Identify contacts at municipalities and other organizations
- Interview contacts to obtain relevant costs information
- Analyze cost information to identify overbank-related costs

A detailed explanation of how each of these steps were carried out is presented in Appendix C.

Description of Expenditure Categories

In this investigation, several kinds of cost categories were included: 1) emergency response and recovery-related activities, 2) lost productivity, 3) lost fees. A description of each of these categories is presented below. Of all the cost categories, 1) emergency response and recovery, accounted for the vast majority of expenses. The other cost categories were only applicable to the City of Palo Alto.

Emergency Response and Recovery-Related Activities

This category includes seven main groups of costs: 1) debris removal, 2) emergency protective measures, 3) damage to water control facilities, and 4) damage to public buildings and equipment, 5) damage to public utilities, 6) damage to public park facilities, 7) regular staff time. Table 4.1 presents examples of these different cost groups.

Lost Productivity

In the context of this study, lost productivity represents to the monetary value of regular city staff time (in hours) lost by the city because employees were unable to get to work.

Lost Fees

This term refers to revenues lost by the city due to the waiving of certain fees, e.g., building permit fees for flood damaged homes.

Table 4.1 Examples of Emergency Response and Recovery Cost Categories

Category	Example(s)
Debris removal	• Clearance of debris and wreckage from publicly and privately owned land • Clean out of debris catch basins, streams, and opening channel or facilities
Emergency Protective Measures	• Buttressing, bracing, or shoring to protect structures • Construction of emergency levees, pumping, sandbagging, patrolling • Search and rescue, fire and police services, EOC activities • Emergency communication and transportation
Road Systems	• Repairs to bridges, embankments, and roads damaged by flooding
Water Control Facilities	• Repair to flood control works (e.g., levees) damaged by flooding
Public Buildings and Equipment	• Repair or replacement of office equipment and vehicles damaged by flooding
Public Utilities	• Repair of water, power, or sewerage systems damaged by flooding
Recreational Facilities	• Repair or restoration of public recreational facilities such as parks, playgrounds, golf courses, etc.
Regular Staff Time	• Time spent by public works engineers assessing damage to flooded homes.

ECONOMIC IMPACT ON CITY OF PALO ALTO

In Palo Alto, the creek began to overtop its banks around 1:30AM on Seneca Street. The floodwaters flowed through Crescent Park and Green Gables neighborhoods, following ground contours until they reached the natural low end of the city. The majority of the flooding and property damage in Palo Alto was a result of floodwaters from San Francisquito Creek flowing across the city, although there were some areas of the city affected by localized flooding due to storm drain backups.[2]

On the evening of February 2, the storm and flood conditions became so severe that the City Manager declared a state of emergency. The City's Emergency Operations

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[2] The focus of this study was on damage from flooding (i.e., creek overbanking), not localized flooding, therefore costs related to localized flooding are not included in this study.

Center (EOC) was activated as the base for incident command and organizational operations. It was staffed 24 hours a day in the initial days of the storm and not de-activated until February 15. The main activities of the EOC included responding to emergency calls, patrolling neighborhoods and providing evacuation notification and assistance, establishing shelter, maintaining road safety, and providing public information. In the days, weeks, and months that followed the flood, the city provided a range of assistance services to residents and the community at large. Public works sent clean up crews into neighborhoods to clear roadways and sidewalks and haul away mud and debris from flooded areas. The fire department also worked around the clock to pump water from basements and crawl spaces.

Table 4.2 presents the details of the flooding's economic impact on Palo Alto expenditures, providing details on specific emergency response and recovery activities. It shows that the majority of the city's costs (93% of total) fall into the Emergency Response and Recovery category. Lost fees accounted for 4% of the total and the remaining 3% were lost productivity.

Table 4.2 Economic Impacts of Flooding on City of Palo Alto

Category	Description	Cost
Emergency Response and Recovery	Removal of trees and debris from creek	$72,311
	Debris removal	$208,091
	City-wide emergency protective measures	$270,485
	Levee repair- Geng Road	$1,968
	Levee repair- Baylands Interpretive Center	$2,622
	San Francisquito Creek at Woodland	$8,953
	Damage to police patrol units	$7,825
	Damage to Water Quality Control Plant	$45,861
	Damage to Municipal Golf Course	$14,870
	Administration (outside consultant to assist in claim prep)	$25,000
	Regular staff time	$125,105
	Subtotal	$783,091
Lost Productivity	Value of lost staff time due to not being able to get to work	$23,000
Lost Fees	Waived building permit fees for flood damaged homes	$33,359
	Total*	**$839,000**

* Value rounded to nearest $1,000

Looking in greater detail at the city's costs indicates that the major expenses incurred by the city were emergency protective measures and debris removal, which together accounted for 57% of the city's total economic impact. The other significant costs was regular staff time spent on flood-related activities, which accounted for 15% of the total.

ECONOMIC IMPACT ON CITY OF EAST PALO ALTO

The City of East Palo Alto was also involved in many of the same emergency protective measures and recovery efforts as Palo Alto. At 11:30PM on February 2, city officials activated an Emergency Operations Center, as flood waters from San Francisquito Creek moved into the Gardens neighborhood on the east side of Highway 101 and the Woodland Avenue area on the west side of the city. During the flooding, the city responded to numerous emergency calls, distributed sandbags, and provided residents and the affected community with sediment debris and clean up services. Table 4.3 presents the details of the flooding's economic impact on East Palo Alto.

Table 4.3 Economic Impacts of Flood on City of East Palo Alto

Description	Cost
Sediment and debris removal from overbanking	$39,493
City-wide emergency protective measures	$66,406
Levee repair- 450 ft section damaged by overbanking	$164,499
Estimate of regular staff time devoted to overbank activities	$19,648
Total*	**$290,046**

* Value rounded to nearest $1,000

The majority of the City's expenses (61% of total) were due to an emergency levee repair. The increased flow in the creek during the flood eroded the banks of about 450 linear feet along the levee adjacent to homes on Jasmine Way and the Palo Alto Municipal Golf Course. The damage had occurred in an area of the creek where it bends and flow is redirected by the bank. Erosion that had occurred in this area had the potential to undermine the levee and could have resulted in a life threatening situation if not immediately addressed. This effort involved stabilizing the bank along the levee. The other major expense category was city-wide emergency protective measures (25% of total).

ECONOMIC IMPACT ON CITY OF MENLO PARK

The City of Menlo Park was also involved in many of the same emergency protective measures and recovery efforts as Palo Alto, but in a more limited capacity. Only a small percentage of the population was affected by the flooding. Nevertheless, the flooding still caused significant damage. Like Palo Alto and East Palo Alto, Menlo Park activated an EOC, responded to emergency calls, distributed sandbags, and provided residents and the affected community with sediment debris and clean up services.

The City of Menlo Park spent a total of approximately $288,000 responding to the flooding. The most significant portion of city expenditures went towards emergency street, slope, and bridge repair near the creek (51%) and city-wide emergency protective measures (42%).

Table 4.4 Economic Impacts of Flood on Menlo Park

Description	Cost
Debris removal	$20,264
City-wide emergency protective measures	$120,767
Emergency street, slope, and bridge repair	$147,190
Total*	**$288,000**

* Value rounded to nearest $1,000

OTHER AGENCIES AND ORGANIZATIONS

Several other agencies and organizations besides the three municipalities discussed above were also involved in flood response and recovery efforts. These include the Santa Clara Valley Water District, the Red Cross, the Office of Emergency Services, and the Federal Emergency Management Agency.

Santa Clara Valley Water District

The Santa Clara Valley Water District also provided assistance in the flood response and recovery effort. Emergency field crews worked to remove debris from the creek and professional staff from the District were sent out on storm patrol to monitor flood hazards and observe flood damage. The District also organized a post-flood meeting to discuss the flood disaster and steps that were being taken and considered to prevent floods along the creek in the future. In total, these activities cost $22,100.

Red Cross

To assist flood victims who were forced to abandon their homes, the Red Cross opened three shelters in response to the flood, one in Palo Alto, and two in East Palo Alto. The center in Palo Alto was located at the Cubberly Community Center. On the morning of February 3, there were 210 people housed at the center from Palo Alto, East Palo Alto, and Mountain View, surrounded by pets and luggage. In Palo Alto, 175 people from 70 homes were housed in the shelter the first night (February 2), and 25 people were housed in the shelter for the next four nights (Ball, 7 October 1998). For Santa Clara county as a whole, it is estimated that the Red Cross spent $30,000 on emergency response-related activities. However, organization staff were unable to determine what portion of that amount could be attributed to efforts to assist Palo Alto residents specifically since this amount included costs for responding to events associated with Coyote Creek and Llagas Creek. (Ball, 7 October 1998; Curb 29 October 1998). In addition, the Palo Alto Red Cross assisted 22 families who applied for financial assistance to replace damaged property and subsidize temporary housing costs (Ball, 7 October 1998).

In East Palo Alto, Red Cross shelters were set up at the Bell Street gymnasium and Cesar Chavez Academy. Red Cross staff responsible for San Mateo County estimate that $178,000 was spent by the organization responding to the flood emergency (Ball, 7 October 1998). Again, it was difficult for staff to separate out what portion of that amount could be attributed to East Palo Alto and Menlo Park, although one staffer estimated that about 50% of the Red Cross' activities in the county went towards East Palo Alto (Curb, 29 October 1998). Red Cross volunteers also canvassed the flooded areas immediately after the flood to assess structural and contents damage to residences using a visual inspection procedure.

State and Federal Agencies

In addition to local agencies and organizations, state and federal agencies, such as the California Office of Emergency Service (OES) and the Federal Emergency Management Agency (FEMA), played a role in the flood response and recovery efforts. These agencies, working in partnership with each other and the affected municipalities were involved in emergency response activities (e.g., immediate danger posed by the flooding) as well as recovery efforts. Many of the costs incurred by the municipalities were or will be reimbursed by OES and FEMA, and a large part of these agencies' involvement in this regard concerns assessing reimbursement claims. A considerable amount of staff time was put into assessing the FEMA claims made by the cities of Palo Alto, East Palo Alto, and Menlo Park.

According to Charles Ramabad, the Office of Emergency Services Area Coordinator for Santa Clara County, the efforts of the these agencies were categorized according to the larger event of the El Niño storms and not specifically to the overbanking of San Francisquito Creek, which was only one of many disasters that occurred due to the El Niño storms. Therefore, it was not feasible for staff to clearly determine a dollar value of the work spent on responding to the San Francisquito Creek flooding. Nevertheless, it is evident that these agencies expended a considerable amount of time in responding to the flood.

SECTION 5
SUMMARY AND CONCLUSION

The results of this study show that the economic impacts of flooding in a heavily populated urban location can be substantial. Even though the flooded area was small, approximately 11,365 acres, and the flooding occurred over a relatively brief time period, the total economic impacts of the flooding totaled over $28 million, making it the costliest flood in Santa Clara County history.

Altogether, approximately 1,700 households were affected by the flooding in Palo Alto, East Palo Alto and Menlo Park resulting in residential damages of $25.5 million. Impacts on businesses and non-profit organizations amounted to a little under $1.14 million, and impacts on the city governments of Palo Alto, East Palo Alto, and Menlo Park summed to over $1.4 million. Figure 5.1 shows how the economic impacts were distributed among the municipalities and Stanford University. Palo Alto sustained the bulk of the total damage, incurring almost $25 million (87 % of total) in monetary impacts, while damages in East Palo Alto amounted to over $2.6 million (9%), Menlo Park $373,000 (2%), and Stanford $184,000 (1%).

Figure 5.1 Economic Impact by City

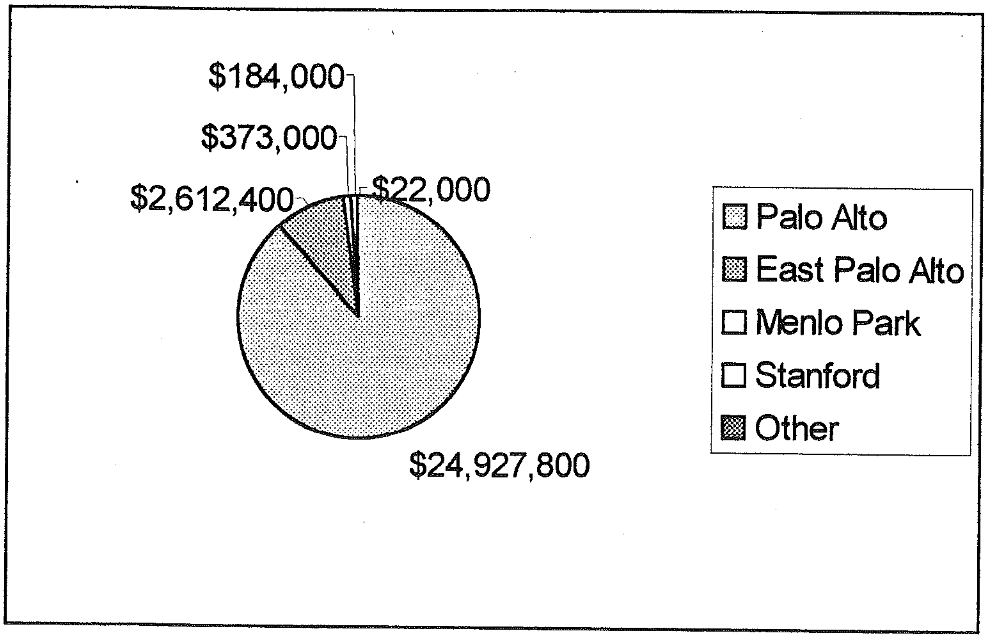
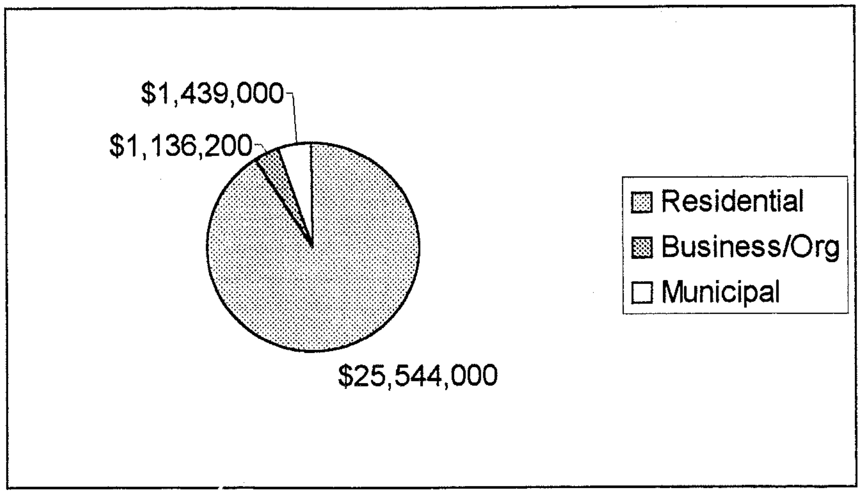


Figure 5.2 illustrates the breakdown of total economic impact according to the stakeholder group affected. It shows that the vast majority (91%) of the damage was incurred by residents, 5% by city governments, and 4% by local businesses and organizations.

Figure 5.2 Economic Impact by Category



This study's findings can be related to other relevant literature concerning the economic impacts of flooding. Like Brenniman's 1991 U.S. Army Corps of Engineers study of flood damage in the Upper Des Plaines River Basin of northeastern Illinois, this investigation illustrates the issues involved in assessing the affects of flooding in a heavily populated urban area in a developed country. In these types of situations, the main concern is economic impact, as opposed to loss of life. (Fortunately, no fatalities were associated with the February flooding of San Francisquito Creek). The scope of the Illinois study was considerably larger than this one, encompassing two major floods that occurred between 1986 and 1987 and 24 communities in Lake and Cook counties. Altogether, the Illinois survey included an area containing approximately 62,000 households, compared to the 1,700 households examined in this study.

From a methodological perspective, the Brenniman study employed many of the same techniques used in the San Francisquito Creek investigation, including a telephone survey. Compared to Brenniman's results, the response rates of both the phone and mail survey for this investigation were significantly greater. The Illinois study's response rate for their phone survey was 15%, while the response rate for this study's phone survey ranged between 75% and 100%. However, the phone survey questionnaire administered by Brenniman was more detailed and lengthier than the phone survey employed in this investigation. The response rate for this investigation's mail survey ranged between 32% and 67%, still significantly higher than the Illinois study phone survey response rate. The ability of this investigation to obtain relatively high response rates validates the representativeness of the data (i.e., that an adequate cross section of residents affected by the flooding responded to the surveys) and the calculations used to make estimates of total flood damage.

Also, the average water damage to homes reported in the Brenniman investigation was significantly less than the average amount of damage in Palo Alto households ($4,149 as opposed to $15,627), which illustrates that flood damage among communities can vary greatly. Even within this study, damages reported by households in Palo Alto and East Palo (average damage of $950) varied greatly. And within Palo Alto itself, the distribution of flood impacts was uneven, with most homes incurring less than $10,000 in damage and a few homes incurring damage greater than $20,000. These differences demonstrate that the impacts of flooding are not evenly distributed over a region or a population.

Another study analyzing the socioeconomic impacts of the 1996 flooding of the Susquehanna River Basin in Pennsylvania conducted by Yarnal, et al. also provides some basis for evaluating this study. The Pennsylvania study was conducted on a much larger geographical scale than this one, and examined a variety of meteorological, hydroclimatic, and socioeconomic data. The major difference between this study and the Yarnal study was the method used to collect socioeconomic data. Yarnal and his colleagues relied heavily on local and regional newspapers for obtaining information on the economic impacts of flooding. This kind of data source yielded only aggregate data and did not distinguish between different kinds of monetary flood damages, which the investigators recognized as a limitation of their study.

In contrast, this investigation based its estimates of economic impacts on data collected from a statistically significant proportion of those directly affected by the flooding. Moreover, the total damage amounts calculated in this study differ markedly from the damage estimates presented in the press (e.g., the Palo Alto Weekly estimated residential damages at 5 million dollars and 400 homes), which were based on 'back of the envelope' calculations city staff made immediately after the flood occurred. The vast difference between the $28 million estimate presented in this study and the $5 million reported in the press indicate that early reports of economic damages in the press are generally very rough estimates and are likely to be low.

Contributions

The cost-related information in this study will be incorporated in the Army Corps of Engineer's database of flood damages and provides valuable empirical data. The data will be used to run risk-based scenarios that simulate a variety of different flood events (e.g., 10-year event, 25-year event, etc.). These scenarios will provide information on the distribution and probability of various flood events and be utilized to make decisions about future flood control activities in the San Francisquito Creek watershed. Estimations of monetary damages presented in this study will also serve as a guide to agencies such as the Santa Clara Valley Water district and other municipalities in the San Francisco Bay area concerning the economic impacts of potential flooding in their jurisdictions.

Another major contribution of this study was its outreach to the Spanish speaking community. For both the residential and business portions of the investigation, significant efforts were made to engage the Spanish speaking community. Spanish speaking residents who were called as part of the phone survey spoke to a native Spanish speaker and the cover letters, surveys, and survey worksheet packets for the residential and business mail surveys were all translated into Spanish. These activities mark one of the first major efforts by the San Francisco District Corps of Engineers to encourage public participation in this minority group. Documents developed as part of this investigation can be used in future outreach efforts in primarily Spanish speaking areas, such as the Pajaro River watershed.

In addition, this study—and its associated methodologies for assessing the economic impacts of flooding on residents, businesses and organizations, and municipalities—could easily be used as a template for developing similar studies in other flooded communities. Step-by-step descriptions are provided in the appendices that would facilitate rapid organization and implementation of what might otherwise be a long and involved research effort.

Finally, this investigation supplements the already existing body of literature concerning management of the San Francisquito Creek watershed, for example, the "Reconnaissance Investigation Report of San Francisquito Creek" (CRMP 1998), the "Draft Watershed Management Plan" (CRMP 1997), and the ongoing San Francisquito Creek Bank Stabilization and Revegetation Study. Together with these studies, this investigation helps provide a more complete picture of activities affecting the watershed and its various stakeholders.

APPENDIX A

RESIDENTIAL SURVEY METHODOLOGY AND SUPPORTING DOCUMENTATION

A1: METHODOLOGY
A2: PHONE SURVEY MATERIALS
A3: MAIL SURVEY MATERIALS (ENGLISH)
A4: MAIL SURVEY MATERIALS (SPANISH)

METHODOLOGY

The study of the economic impacts of the San Francisquito Creek flooding involved conducting surveys (questionnaires) of homeowners, renters, and property owners affected by the flooding. The development, administration, and data analysis of the residential survey followed the general survey research methodology suggested by the Army Corps of Engineers. This methodology consists of the following steps (note: in the following discussion, the terms questionnaire and survey are used interchangeably):

1) Defining objectives
2) Selecting the survey method(s)
3) Designing the questionnaire
4) Pre-testing the questionnaire and procedures
5) Selecting a sample
6) Selecting and training personnel to administer questionnaire
7) Collecting the data
8) Assessing non-responses
9) Coding, entering, and editing data
10) Analyzing data
11) Report writing

Descriptions of how each step was implemented in the course of this investigation are outlined in the following discussion.

Step 1: Defining Objectives

The objectives of the residential survey were to obtain an estimate of direct and indirect economic losses incurred by residents of Palo Alto, E. Palo Alto, and Menlo Park as a result of the February 1998 San Francisquito Creek flooding. The focus of the study was the impacts of creek overbanking (i.e., not flooding from storm drain back-up or soils being over-saturated with water).

Step 2: Selecting the Survey Method(s)

Based on the level of detail needed (e.g., specific cost information on losses related to various kinds of structural damage and contents), a combination of phone and mail survey was selected was selected as the primary data gathering technique. The purpose of the phone survey was to ascertain, in general, what proportion of residences in the flooded area were affected by the flooding. The purpose of the mail survey was to obtain more detailed information from households that had been adversely affected by the flooding.

A mail survey method was selected as the most appropriate method of data collection for obtaining detailed data from residents for two main reasons. First, in order to provide accurate cost information, respondents would need to have insurance records and receipts readily available, a situation that would be unlikely if the respondent was asked to provide information over the phone. Second, completing the survey will be a lengthy process. These conditions suggest that a mail survey method would be the most reasonable for the purposes of this study. In order to increase the response rate (i.e., the percentage of people contacted who agree to participate in the study), we first called the potential respondents and asked for their cooperation with the study. Then, if the respondent agreed to participate further in the study, we sent them a packet of survey materials in the mail.

Step 3: Designing and Phone and Mail Survey Materials

Phone Survey

In administering the phone survey, volunteers were asked to contact residents living in the flooded area and ask them a series of questions regarding the February flooding. Table A1 below presents the series of five questions that phone respondents were asked to ascertain whether or not they incurred any damages due to the flood. Specific details on how the volunteers were trained and how responses were coded are discussed in step 9 of the overall study process.

Table A1. Phone Survey Questions

1. Did the February 1998 flooding damage, in any way, your residence's permanent structures? Examples of structures that might have been damaged by the flood include any electrical, plumbing, or mechanical work as well as doors and windows, floors and carpets, and landscaping.
2. Did the February 1998 flooding damage, in any way, possessions in your residence? Examples of possessions that might have been damaged by the flood include furniture, computers, sports equipment, clothing, and books.
3. Did the February 1998 flooding damage, in any way, vehicles, for example cars or motorcycles, that were located at your residence during the time of the flood?
4. Did any members of your household, including yourself, spend time in an emergency shelter or temporary housing due to any aspect of the February 2 and 3, 1998 flooding?
5. Did any wage earners in your household, including yourself, miss any days of work due to any aspect of the February 2 and 3, 1998 flooding?

Mail Survey

Residents contacted by the phone survey, identified as being affected by the flood, and who agreed to participate in the mail survey were sent a packet containing the following items:

- Cover letter
- Survey form
- Flood damage worksheets
- Santa Clara Valley Water District refrigerator magnet
- Information on flood preparedness

Copies of the cover letter, survey form, flood damage worksheets (in English and Spanish) and flood preparedness information are located in this appendix, Section A2 and A3.

The cover letter presented residents with background information on the study and its overall objectives. It also assured participants of the confidentiality of any information they provided and listed contact information for personnel to contact in case they wanted more information on the investigation. The cover letter was sent out with the signatures of high level management at the U.S. Army Corps of Engineers, the Santa Clara Valley Water District, and the three participating municipalities (i.e., Palo Alto, East Palo Alto, and Menlo Park).

Table A2 below presents examples of data fields included on the mail survey form.

Table A2. Overview of Residential Survey Form Contents

I. GENERAL INFORMATION
- Interviewee's name
- Names and ages of other household members
- Address
- Phone number
- Response code (assigned by interviewer)

II. STRUCTURAL DAMAGE
- Direct (e.g., electrical, plumbing, mechanical)
- Indirect (e.g., time spent making repairs to structural damage)

III CONTENTS DAMAGE
- Direct (e.g., clothing, computer equipment, tools)
- Indirect (e.g., time spent replacing or repairing contents

IV. VEHICLE DAMAGE
- Cost to repair or replace damaged vehicles
- Other transportation-related expenses

V. OTHER DIRECT AND INDIRECT DAMAGES
- Time spent in emergency shelter
- Time spent in temporary housing
- Time lost from work and associated income
- Money spent on additional food and lodging incurred as result of flood

VI. FLOOD CHARACTERISTICS
- High water depth
- Length of time flood water in residence

VII. OTHER COMMENTS
- Any other flood experiences that residents wanted to document

Step 4: Pre-Testing Questionnaire and Procedures

Phone Survey

The principal investigator pre-tested the phone survey materials and sample data by calling twelve phone numbers of residences believed to be in the flooded area. This calling was done several days prior to training the phone bank volunteers so that the call sheets (i.e., the sheets with contact information on residents living in the flooded area and other coding information), call scripts, and training materials could be adjusted to better fit the calling situation.

Mail Survey

In order to pre-test the survey form and worksheets, several residents residing in the St. Francis Drive neighborhood, an area hit particularly hard by the flooding, were asked to complete draft versions of the survey form. Three residents completed and made comments about the survey, and the draft survey materials were adjusted accordingly. Examples of comments made on improving the survey included adjusting categorizations of structural damage to make them more consistent with contract work actually incurred by residents and separating contents damage worksheets from the main survey form.

Step 5: Selecting a Sample and Obtaining Contact Information

Phone Survey & Mail Survey

The first step in survey sampling is to define the population that is being surveyed and reduce it to a sampling frame, or actual list of population members, from which the sample will be drawn. The sampling frame for the phone survey was the list containing street number and available contact information for all addresses believed to be in the flooded area. The sampling frame for the mail survey were those households identified by the phone survey as being adversely impacted, in some way, by the flooding.

The sampling process recommended by the Corps (January 1993: 38-48) consists of the following steps:

- Defining the sampling frame
- Determining sample size
- Choosing the sampling method

According to the Corps (October 1991: 44), "a population consisting of only those structures which have been flooded is of interest for studies concerning historic flood damages (e.g., studies to develop depth-damage relationships). Other structures which were not flooded would not be included in this sampling frame." Applying the above recommendation to this particular study implies that only structures actually damaged by the flooding should be surveyed in detail.

The population of interest to this study was all residential structures in Palo Alto, E. Palo Alto, and Menlo Park in the "flooded area."[1] And the sample frame for this population was the list of available addresses, phone numbers, and resident/property owner information for those residential structures.

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[1] The term, "flooded area" refers to where creek waters flowed over land.

Determining Sample Size (n)

The following excerpt from the Corps (October 1991: 44-45) presents general guidance on determining sample size (n):

"A sample [n] provides an estimate of what one would find if every member of the sampled population [N] were to be surveyed. There is always some error associated with any sample. The amount of sampling error that one is willing to tolerate, or the amount of precision required, is the criterion generally used to determine sample size."

Table A3 below present the key parameters used in this study to estimate an appropriate sample size. It shows that the key variable was the estimated sum of structural and contents damage, that the tolerable error ranged from $5,000 to $10,000, and that selected confidence intervals were 90% and 95%.

Table A3. Parameters Used to Estimate Sample Size for Phone Survey

- Key variable: "estimated sum of structural and contents damages"
- Range(s) of key variable: approximately $160,000 for Palo Alto (Based on an informal survey conducted by the St. Francis Neighborhood Association in Palo Alto); approximately $80,000 for E. Palo Alto (approximation of relationship between building values in Palo Alto and E. Palo Alto)
- Tolerable error (E): plus or minus $5,000 and plus or minus $10,000 of true mean
- Confidence intervals (CI): 90% and 95% (The associated t values (number of standard deviations) for these C.I. are 1.96 and 1.65, respectively.

Calculating Sample Size:

The formula following formula can be used to estimate the number of surveys that would need to be completed in order to estimate total economic damages.

$n = t^2 * s^2/E^2$

Where n = sample size
s^2 = variance of the variable (i.e., total structures and contents damage); the statistics guides I used recommend using the range of the key variable divided by four as an approximation of the variances
E = tolerable error
t = the t table value corresponding to the probability that the resulting sample estimate will be within the specified range of precision.

Applying this formula for the cities of Palo Alto and E. Palo Alto yields the sample sizes shown in Table A4. The entries marked in italics and bold were the ones selected for this study.

Table A4. Potential Sample Sizes for Palo Alto and East Palo Alto

City	C.I.	T	s (range/4)	E (in $)	n
Palo Alto	95	1.96	40,000	10,000	61
Palo Alto	90	1.65	40,000	10,000	41
Palo Alto	95	1.96	40,000	5,000	246
Palo Alto	***90***	***1.65***	***40,000***	***5,000***	***174***
E. Palo Alto	95	1.96	20,000	10,000	15
E. Palo Alto	90	1.65	20,000	10,000	11
E. Palo Alto	95	1.96	20,000	5,000	61
E. Palo Alto	***90***	***1.65***	***20,000***	***5,000***	***44***

Adjusting Sample Size

According to the National Economic Development Procedures Manual-Public Surveys (IWR Report 93-R-2: 42), "for a small population, where the sample size is more than 5%of the sample frame [in this case, the study population], the same level of precision can be obtained with a relatively smaller sample size. This is estimated by multiplying the formula by a finite population correction [factor] to derive the final sample size needed."

The equation used to calculate the finite population correction (fpc) factor is as follows:

$$fpc = (N - n) / (N-1)$$

Where N = total population size
n = initial sample size

Applying this formula to the Palo Alto case yields the following results:

N = homes in the flooded area (2,000)

$fpc = (2,000 - 174) / (2,000 - 1) = 0.91$ ====== n' (new sample) = 174 * 0.91 = 159

Apply this formula to the E. Palo Alto case yields the following results:

N = homes in flooded area (1,120)

$fpc = (1,120 - 44) / (1,120 - 1) = 0.96$ ====== n' (new sample) = 44 * 0.96 = 43

Therefore, applying the finite population correction factor to the cases of Palo Alto and East Palo Alto, the following values were used as target sample sizes for the phone survey portion of this investigation.

Palo Alto:	**159**
E. Palo Alto:	**43**

After completion of the phone survey, another calculation was developed to test the accuracy of the study's sample size. This calculation was based on the percentage of phone survey respondents that answered "yes" to any of the flood damage questions and follows the method suggested by the Army Corps of Engineers (ACE 1991:46) and is also used by Brenniman (1991) in his study of flood damages. This method recommends using the following formula to determine the level of precision of this study's estimates given the actual sample size.

$$n = t^2 * pq / (rp)^2$$

n = sample size
p = estimate of the proportion of responses for the question of interest (e.g., "yes" to incurring flood damages)
q = the proportion of other responses to the question
r = level of precision desired (e.g., .05, 0.10). This is the number of plus or minus percentage points of tolerable error away from the true proportion.
t = t table value corresponding to probability that resulting sample estimate of the proportion will be within the specified range of precision. The t value of 1.96 provides 95% confidence that the estimate of the proportion is within the number of percentage points of the true proportion specified by the level of precision.

$n = 1.96^2 * (0.52)(0.48) / (.075*(0.52))^2 = 630$

The calculated n is 630, compared to the actual sample size of 692. Therefore, given the study's sample size, we can make the following statement about its accuracy:

There is a 95% probability that the true proportion of households adversely impacted in some way by the flooding is between 48.1% and 55.9%.

Choosing the Sampling Method:
The recommended sampling method for this study was *random* sampling.[2] Once all available contact information for all the addresses believed to be in the flooded area was collected, individual records were created that linked together address fields with contact information (e.g., name, phone number). Once all the records for each city were

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[2] Since it was not possible to clearly determine what percentage of the lists experienced specific levels of flooding for both Palo Alto and E. Palo Alto, a stratified sampling method was not feasible not without using different sampling methods for the two cities.

complied, the list was randomized using a function on the Microsoft Excel software program. Phone bank volunteers then used this set of randomized records to contact residents for the phone (and mail) survey.

Obtaining Contact Information

Once the general study boundaries (i.e., flooded areas) for each city were determined, efforts were made to collect contact information for all addresses in the flooded areas. The primary sources for this data were CD ROMs with reverse search capabilities (e.g., MetroScan and ProCD) and reverse phone directories (e.g., Haines directory). While every effort was made to obtain correct contact information for addresses in the flooded area, it was not possible to contact residents who had moved, changed their phone numbers recently, had unlisted phone numbers, or who did not list their address in the phone directory.

After all available contact information for addresses in the flooded area was obtained, spreadsheets were created in Microsoft Excel to provide each record (i.e., address and associated contact information) with additional fields for data collection. Each sheet with contact information and spaces for additional information was called a call sheet. These call sheets were used by SCVWD volunteers to record information on calls they made to residents in the flooded area. The types of information recorded included that status of the call (e.g., busy signal, call back, successful contact, refusal) and whether or not the respondent was affected by the flood. An example call sheet is presented in Figure A1.

Figure A.1 Example Call Sheet*

	OWNERFIRST	OWNERLAST	NO	STREET	ZIP	PHONE	F	T/L	CC1	CC2	CC3	Q1	Q2	Q3	Q4	Q5	Part?	S-code
1	Charles	Prince	925	Forest Ave	94301	326-1648		T										
2	Alexis	Fleishmann	741	De Soto Dr	94303	326-9114	Y											
3	Judy	Jetson	675	Greer Rd	94303	858-1230		T										
4	Felix	Hsu	1201	Dana Ave	94301	328-4721												
5	Cindy	Warren	320	Fulton St	94301	326-6317		T										
6	Timothy	Adams	329	Iris Way	94303	857-9331		T										
7	Jim	Benton	1005	University Ave	94301	327-7771												
8	Howard E	Wagner	580	W Crescent Dr	94301	325-3125												
9	Julia	Flotsam	2256	Santa Ana St	94303	856-1258												
10	Edward	Frey	1257	Martin Ave	94301	325-1835												

* Note: to ensure the confidentiality of study participants, fictitious names and phone numbers are used here

Step 6: Selecting and Training Personnel to Administer Questionnaire

From November 12 through November 15, 1998, 14 volunteers from the Santa Clara Valley Water District made over 2,300 calls to residents in Palo Alto, East Palo Alto, and Menlo Park believed to live in the flooded area. The volunteers were part of the District's administrative support staff. The calls were made on weekday evenings between 6:00PM and 9:00PM and during the day on weekend days. The total number of calling hours was approximately 110. Table 1. below presents summary data on the number of addresses included in the study and the number of calls made to residents in each city.

Prior to calling residents, phone bank volunteers were provided training on how to make calls, speak to residents, answer potential questions, prepare survey packets for mailing, and record information on each telephone call made. The training materials (calling and mailing procedures and call scripts) are presented in section A2 of this appendix.

Step 7. Collecting the Data

Phone

After each phone call, the phone bank volunteers recorded the results of each call, using boxes on the call sheets to record data. If corrections needed to made to a particular record (e.g., change of name), the volunteers noted necessary changes on the call sheets themselves. At the end of each calling session (there were four total), shift supervisors tallied up the results of each sessions calling efforts recording how many residents agreed to participate in the study and how many of those residents reported suffering some adverse effect from the flooding.

Mail

Collecting the data for the mail survey involved gathering returned surveys as they came in and identifying which city the survey respondent was residing in. It also involved matching up the survey codes hand-written on each survey with the corresponding codes on the database records used to record the survey data.

Step 8: Assessing Non-Responses

In the course of gathering data for the study, some of the residents contacted refused to participate in the study (either by phone or mail). This non-response appeared to be due to random reasons (e.g., did not have time, did not feel like completing the survey, wary of talking to strangers, etc.) and it is believed that those who did not respond did not differ markedly from those residents who did. Moreover, for the phone survey in particular, the refusal rate was very low. Therefore, the likelihood that the non-response of some residents would significantly bias the overall study results appears low.

Step 9: Coding, Entering, and Editing Data

Phone Survey

For each call sheet, data was entered into a computer spreadsheet recording the results of each call made by the volunteers. The tally sheet for Palo Alto is presented in Figure A2.

Figure A2. Call Talley Sheet Data for Palo Alto

PAGE	NA/BS	NIS/WN	CB	SC	RF	UNCLEAR	NO DAM	SURVEY	D-RF SURV
1	12	2	0	7	0	0	3	4	
2	13	2	0	5	0	0	2	3	
3	12	1	0	5	1	0	4	1	
4	5	0	0	6	1	0	4	1	1
5	10	1	0	7	0	0	2	5	
6	8	4	0	5	0	0	3	2	
7	8	2	1	8	0	0	3	5	
8	10	1	0	8	0	0	1	7	
9	8	2	2	6	1	0	3	3	
10	11	1	1	7	1	0	2	4	
11	11	1	0	6	1	0	2	4	
12	4	2	0	8	0	0	4	4	
13	10	4	0	5	0	1	1	4	
14	12	0	1	6	0	0	2	3	1
15	3	2	1	7	0	0	2	5	
16	2	3	0	8	0	0	3	5	
17	3	4	0	6	0	0	3	3	
18	15	1	0	5	0	0	0	3	2
19	14	2	1	4	0	0	2	1	1
20	11	0	0	8	1	0	3	4	1
21	11	0	0	6	2	0	1	5	
22	9	0	0	9	1	0	4	5	
23	1	3	0	8	1	0	2	6	
24	7	1	0	5	0	0	2	3	
25	8	0	0	4	1	0	3	1	
26	7	0	0	5	0	0	2	3	
27	1	0	1	11	0	0	4	7	
28	10	0	2	6	0	0	0	6	
29	11	0	0	8	0	0	3	5	
30	4	2	4	7	1	0	2	5	
31	9	1	1	8	0	0	3	5	
32	12	0	1	4	0	0	3	1	
33	11	0	1	9	0	0	4	5	
34	10	0	0	6	0	0	4	2	
35	11	2	0	5	1	0	3	2	
36	16	1	0	6	1	0	1	5	
37	10	2	1	3	1	0	1	2	
38	4	2	0	9	0	0	5	3	1
39	13	1	0	5	0	1	4	1	
40	8	2	0	6	0	1	2	3	
41	10	1	0	8	0	0	7	1	
42	6	1	0	8	1	0	5	3	
43	12	1	0	6	0	0	3	2	1
44	13	3	0	8	0	0	5	3	
45	12	0	0	9	0	0	3	6	
46	4	2	0	6	1	0	3	3	
47	6	1	0	5	0	0	0	5	
48	6	1	0	6	0	0	3	3	

PAGE	NA/BS	NIS/WN	CB	SC	RF	UNCLEAR	NO DAM	SURVEY	D-RF SURV
49	8	2	0	3	1	0	1	1	1
50	9	1	1	5	1	0	2	3	
51	6	1	1	4	0	0	3	1	
52	8	2	1	3	4	1	2	1	
53	5	1	0	6	1	0	2	4	
54	18	3	0	4	0	0	1	3	
55	8	0	0	5	0	0	2	3	
56	6	1	0	6	0	0	4	2	
57	12	1	0	6	0	0	2	4	
58	10	2	1	7	0	0	5	2	
59	5	4	0	4	1	0	3	1	
60	9	1	0	3	0	0	0	3	
61	6	1	0	6	0	0	2	4	
62	9	0	0	3	0	0	1	2	
63	5	2	0	6	0	0	2	4	
64	11	2	0	5	1	0	3	3	
65	9	2	0	3	0	0	1	2	
66	15	0	0	7	0	0	3	4	
67	3	2	1	6	0	0	3	3	
68	4	3	1	5	0	0	5	0	
69	7	3	0	2	0	1	2	0	
70	5	2	0	6	0	0	3	3	
71	6	1	2	3	0	1	2	1	
72	5	1	0	5	0	1	3	2	
73	4	5	0	3	1	0	2	1	
74	8	1	1	2	1	0	2	0	
75	1	2	2	7	0	0	4	3	
76	10	0	0	8	1	0	2	6	
77	8	1	0	5	0	0	2	3	
78	6	2	1	3	1	0	1	2	
79	5	1	1	6	0	1	2	4	
80	7	2	1	3	0	0	2	1	
81	6	1	0	5	0	1	0	5	
82	7	1	1	4	0	0	3	1	
83	7	3	0	4	0	0	1	3	
84	9	0	0	8	1	0	5	2	1
85	11	1	0	2	0	0	2	1	
TOTAL	**702**	**120**	**33**	**486**	**31**	**9**	**216**	**260**	**10**

STATISTICS

TOTAL NO.CALLS MADE:	**1381**	(NA/BS+CB+SC+RF)
HIT RATE:	**40%**	((CB+SC+RF)/969)*100
NO. RESPONDENTS:	**486**	(No Dam+Survey+D-RF Surv)
PERCENT RESP. DAMAGE	**56%**	((Survey+D-RF Surv)/202) * 100
PERCENT RESP. NO DAM	**44%**	(No Dam/202) * 100
PARTICIPATION RATE	**87%**	(No Dam+Survey)/202 * 100

CODE DEFINITIONS

NA/BS	NO ANSWER OR BUSY
NIS/WN	NOT IN SERVICE OR WRONG NO.

PAGE	NA/BS	NIS/WN	CB	SC	RF	UNCLEAR	NO DAM	SURVEY	D-RF SURV

CB	CALL BACK
SC	SUCCESSFUL CONTACT
RF	REFUSAL
UNCLEAR	VOLUNTEER'S ENTRY UNCLEAR
NO DAM	RESPONDENT SUFFERED NO ECONOMIC LOSSES
SURVEY	RESPONDENT SUFFERED LOSS AND WAS MAILED SURVEY
D-RF SURV	RESPONDENT SUFFERED LOSS, BUT REFUSED SURVEY

Mail Survey

In this step of the process, data from the each mail survey completed and returned was entered into a spreadsheet database created using Microsoft Excel. For each address whose household or owner returned a survey, entries were made corresponding to the respondent's responses to each one of the survey questions.

Step 10: Analyzing Data

The purpose of this step was to take data collected from the phone and mail surveys and determine what kind of assertions could be made about the population as a whole. In particular, the data analysis aimed to answer the following main questions:

- How many residences, businesses, and organizations in the flooded area were impacted?
- What was the extent of the economic damages incurred (both direct and indirect)?
- What were other significant non-economic impacts (especially on residents, businesses, and organizations)?

In order to answer the first main question, the results of the phone survey were used. The calculation employed was the following.

% respondents with adverse flood effect * total no. addresses in the flooded area

For East Palo Alto, this calculation was 39% * 1,364 = 533

Therefore, the estimate of addresses affected by the flooding is 533.

In answering the second main question, the results of the mail survey were used. Total damage amounts were calculated using a variety of equations depending on the category of the damage and the representativeness of the responses (i.e., the response rate for a particular question or set of related questions on the survey). The process described in this section shows how an estimation of total residential structural damage for Palo Alto was determined. Similar procedures were used to calculate other flood damages.

Step 1: Determine how many households incurred a specific type of monetary damage.

1,155 * 0.71 = 820

1,155	total no. of homes damaged by flooding
0.71	percentage of respondents that responded 'yes' to question asking if they incurred structural damage due to flooding

Step 2: Sum monetary damages for respondents

Sum of reported structural damage = $1,812,800

Step 3: Calculate average value of monetary damages

$1,812,800 divided by 107* = $16,900

* number of households that provided specific monetary estimate of structural damage

Step 4: Multiply the average value for monetary damages calculated in step 3 by estimated number of household in flooded area that incurred damage.

$16,900 * 820 = $13,858,000

Analysis of significant non-economic impacts came partly from assessing total hours of inconvenience (i.e., hours spent on flood-related activities that could have been spent otherwise had the flood not occurred). The procedure for determining total hours of inconvenience is similar to the procedure used to calculate economic damages described above. In addition, the handwritten comments of residents were reviewed and some comments were incorporated into the final report.

Step 11: Report Writing

Once the data on the main stakeholders affected by the flood were collected and analyzed, a report was written to summarize the investigation's results. The main purpose of the report was to present, in an organized fashion, an overview of the economic impacts, both direct and indirect of the February 1998 flooding of San Francisquito Creek. The report is separated into six main sections:

1. Introduction: the basic characteristics of the flood event, the scope of the investigation, summary of economic impacts to residents, businesses and organizations, and municipalities, potential areas of future study.
2. Residential impacts: summary of monetary residential impacts, impacts on Palo Alto, impacts on East Palo Alto, impacts on Menlo Park
3. Business and organization impacts: summary of monetary business and organization impacts, impacts on businesses (loss of business, direct damage, indirect damage) in Palo Alto, impacts on organizations in Palo Alto, impacts on businesses in East Palo Alto, impacts on organizations in East Palo Alto, non-monetary impacts.
4. Municipality impacts: summary of monetary impacts on three municipalities, summary of monetary impacts on Palo Alto, summary of monetary impacts on East Palo Alto, summary of monetary impacts on Menlo Park.
5. Other local organizations impacted: impacts on SCVWD, Red Cross, etc.
6. Appendices: research methodology and supporting documentation.

SECTION A2: PHONE SURVEY MATERIALS

SAN FRANCISQUITO FLOOD ECONOMIC IMPACT STUDY

PHONE BANK VOLUNTEERS
CALLING AND MAILING PROCEDURES

Thank you for volunteering to make phone calls asking local residents to participate in our study. Your efforts will enable us to collect valuable data on last winter's flooding.

Your objective is to make phone calls and ask people who live or own property in the flooded area to participate in our study. A person's participation may be as simple as answering five quick questions over the phone, or it might involve asking them to fill out a written survey that we will mail to them. You will be responsible for finding out and recording the following information for each person you call . . .

- IS THIS PERSON WILLING TO PARTICIPATE IN THE STUDY AT ALL?
- WAS THIS PERSON AFFECTED BY THE FLOODING?
- IS THIS PERSON WILLING TO FILL OUT A SURVEY ABOUT THEIR FLOOD EXPERIENCE?

You will also be responsible for assembling a mailing packet for each person you call who agrees to fill out the survey.

CALLING PROCEDURES

When you arrive at the EOC, you will be given a set of CALL SHEETS that contain phone number, name, and address information. The CALL SHEETS will also contain spaces for you to write in information about what happened each time you made a phone call. Once you are assigned a phone, start making calls using the 'CALL SCRIPTS' to guide you through your conversations.

Use the following Calling Codes to record information about the result of your call on the CALL SHEETS.

Calling Codes (CC):
BS = Busy
NA = No Answer/Answering Machine
RF = Refusal
NIS = Not in Service
WN = Wrong Number
SC = Successful contact (i.e., correct person and person agrees to answer questions)

If you are calling a number that has not been called previously, enter the result of the call in the box labeled 'CC1' (calling code 1).

If this is the second time the number is being called, enter the result of the call in the box labeled 'CC2' (calling code 2).

If this is the third time the number is being called this number, enter the result of the call in the box labeled 'CC3' (calling code 3).

CALLING PROCEDURES (continued)

If the number has already been called three times, skip that number and move on to the next phone number.

[E. PALO ALTO CALLS ONLY]
If it is difficult to easily communicate with the person you are calling because he/she is a native Spanish speaker, try to tell the person that someone will call him/her back and check the 'SP' box on the CALL SHEET.

If the person you are calling agrees to answer the questions, proceed to the 'Questions' script and follow the instructions on the script. Make sure you enter in the call sheet the person's response to each question, either 'Y' for yes or 'N' for no.

If the person answers yes to any of the Questions, proceed to the 'Big Request' script and follow the instructions on the script.

Enter 'Y' for yes or 'N' for no in the 'Part?' box of the call sheet, depending on whether or not the person on the phone agrees to fill out the survey.

[PALO ALTO CALLS ONLY]
If the person you ae calling agrees to participate in the study (i.e., let's us mail a survey to him/her, AND if the person is marked 'L' or 'T' in the 'L/T' box on the CALL SHEET, proceed to the 'Landlord' script for those marked 'L' and the 'Tenant' script for those marked 'T.'

If you need to mail the person you just talked to a survey, assign the person a survey code ('Scode). The survey code is made up of the following data: 1) your first and last initials, 2) the day you made the call, and 3) the number of surveys you have mailed out so far on the day of your call (e.g., if the call was your 5th survey you sent that day, the number would be 5). For example, if my name is Jane Doe and I made my call on November 14 and this was the 6th survey I was sending out that night, I would assign the person I just talked to the survey code JD1406.

When your calling shift is over, hand your 'CALL SHEETS' to the PERSON IN CHARGE. These sheets will need to be updated daily, so please remember to turn them in.

Calling tips

Positive attitude: people are more likely to say 'yes' to your requests if you speak in a friendly, animated voice.

Don't get discouraged: don't worry if someone is rude to you or hangs up on you over the phone. He/she probably just had a bad day and his/her behavior has nothing to do with you. Take a deep breath, take a brief break if you want, then move on to the next call.

Remember to mark your call sheets: In the excitement of getting a person to actually answer your questions, you might forget to fill out your call sheets. After you hang up with a person, make sure you clearly filled out the appropriate boxes on the CALL SHEET. The data you write on the call sheet is IMPORTANT data we will use to conduct our economic analysis.

Questions: If someone asks you a question about the study that you can't answer, you can either refer him or her to a supervisor or make a note of the question on your call sheet.

MAILING PROCEDURES

After you hang up with a person who agreed to complete the survey, congratulate yourself (good job!). Then, prepare a mailing packet for him/her. You should have cover letters and surveys handy because you will need to write on them before you mail out the survey packet.

The mailing procedures are as follows:

Write the person's name on the blank space at the top of the COVER LETTER (e.g., Tom or Mrs. Gutierrez)

Write the Survey Code you just assigned to this person on your CALL SHEET onto the SURVEY CODE line on the first page of the SURVEY.

Place the COVER LETTER, SURVEY, WORKSHEET PACKET, MAGNET, NEWSPAPER INSERT, and RETURN ENVELOPE into the LARGE ENVELOPE. Please order the materials so that the cover letter and survey are the first items the person opening the envelope will see.

Write the person's address (from your CALL SHEET) on mailing label

Seal the LARGE ENVELOPE with the person's address on it, and place it in the TO BE MAILED box.

SAN FRANCISQUITO CREEK FLOOD ECONOMIC IMPACT STUDY

PHONE BANK VOLUNTEERS CALL SCRIPTS

INTRODUCTION

Hello, this is ______________ (your name), and I'm calling from the Santa Clara Valley Water District. May I please speak with __________ or __________ (the names of the people on your list)?

[If neither of those people on your list matches up with the phone number, verify the address and ask to speak to an adult in the household and obtain his/her name.]

Hi, _________ (name of person you are talking to). We are currently conducting a study in cooperation with the U.S. Army Corps of Engineers in San Francisco and the city governments of Palo Alto, E. Palo Alto, and Menlo Park. This study concerns evaluating the economic impacts of the flooding of San Francisquito Creek that occurred on February 2 and 3 of this year. This flooding was the largest ever recorded for San Francisquito Creek.

Your address or the address of a property you own was identified as being located in the flooded area and we would like to briefly ask you some questions about your flood experience. Would that be okay with you?

[Obtain a positive or negative response from person on the phone. If person says no, thank them for their time and politely hang up. If person says yes, proceed with the **QUESTIONS** script.]

QUESTIONS

Thank you very much. Now I'm going to read you a series of questions about damages the February flooding might have caused to you, your residence, or your possessions. In response of each of these questions, please answer simply yes or no.

1. Did the February 1998 flooding damage, in any way, your residence's permanent structures? Examples of structures that might have been damaged by the flood include any electrical, plumbing, or mechanical work as well as doors and windows, floors and carpets, and landscaping.

   Yes No

   [If No, go to Question 2.]

   [If Yes, go to **BIG REQUEST** script]

2. Did the February 1998 flooding damage, in any way, possessions in your residence? Examples of possessions that might have been damaged by the flood include furniture, computers, sports equipment, clothing, and books.

   Yes No

   If No, go to Question 3.

   [If Yes, go to **BIG REQUEST** script]

3. Did the February 1998 flooding damage, in any way, vehicles, for example cars or motorcycles, that were located at your residence during the time of the flood?

   Yes No

   If No, go to Question 4.

   [If Yes, go to **BIG REQUEST** script]

4. Did any members of your household, including yourself, spend time in an emergency shelter or temporary housing due to any aspect of the February 2 and 3, 1998 flooding?

   Yes No

   [If No, go to Question 5.]

   [If Yes, go to **BIG REQUEST** script]

5. Did any wage earners in your household, including yourself, miss any days of work due to any aspect of the February 2 and 3, 1998 flooding?

   Yes No

   [If No, wrap up conversation]

   Those are all the questions I needed to ask. Thank you very much for participating in our study. Before I go, could I just verify you name and address?

   [Verify name and address, make any necessary corrections on call sheet. Thank the person and politely hang up.]

   [If Yes, go to **BIG REQUEST** script]

BIG REQUEST

____________ (name of person you are talking to), we would like to mail you a survey packet containing more detailed questions that ask you about the economic damages you suffered as a result of the February flooding. The survey should take between 10 and 30 minutes to complete, and it also includes a set of flood damage worksheets that you can use for your own personal record keeping and tax purposes. All your responses will be confidential and your name will not be directly associated with any information you provide.

Your participation will enable your city government, the Water District, and the Corps of Engineers to better understand the impact of this record flood on your community. It will also help us to more accurately determine the benefits of flood damage reduction projects in your area.

We would really appreciate your participation in this important study. Would you be willing to help us and complete the survey?

[Obtain a positive or negative response from person on the phone. If person says no, thank them for their time and politely hang up. If person says yes (hooray!), proceed as follows.]

Great. Thank you very much. If I could just verify your name and address, I will send the survey packet out to you tomorrow. Please try to complete the survey within seven days of receiving it and return in the enclosed postage paid envelope.

[Verify name and address, make any necessary corrections on call sheet. Thank the person and politely hang up.]

LANDLORD

Based on the information I have here, it seems like your property also has a tenant or tenants who might have also suffered economic losses as a result of the flooding. In order to get accurate information for this address, we would also like to contact your tenants. Would it be possible to obtain the name and phone number of your tenants from you so that we could ask if they would be willing to fill out a survey as well?

[If person does indeed have a tenant and is willing to provide contact information, record tenant information on call sheet, thank person, and politely hang up.]

TENANT

Based on the information I have here, it seems like your address also has a landlord who might have also suffered economic losses as a result of the flooding. In order to get accurate information for this address, we would also like to contact your landlord. Would it be possible to obtain the name and phone number of your landlord from you so that we could ask if they would be willing to fill out a survey as well?

[If person does indeed have a landlord and is willing to provide contact information, record landlord information on call sheet, thank person, and politely hang up.]

ANSWERS TO POTENTIAL QUESTIONS

Q: WHAT IS THE PURPOSE OF THIS CALL?

A: THE DISTRICT AND ARMY CORPS OF ENGINEERS ARE CONDUCTING A STUDY ON LAST WINTER'S FLOOD AND WE WOULD LIKE YOUR INPUT. WE ARE NOT SELLING ANYTHING.

Q: HOW LONG WILL IT TAKE? [SCREENING QUESTIONS]

A: ANSWERING THE QUESTIONS SHOULDN'T TAKE MORE THAN 3 MINUTES.

Q: HOW DID YOU GET MY NAME AND PHONE NUMBER?

A: YOUR ADDRESS WAS SELECTED AT RANDOM FROM A DATABASE OF ALL ADDRESSES IN THE FLOODED AREA. YOUR NAME AND PHONE NUMBER CAME FROM THE PHONE BOOK OR THE SANTA CLARA COUNTY TAX ASSESSOR'S OFFICE.

Q: WHAT DO YOU MEAN BY STRUCTURAL DAMAGE?

A: STRUCTURAL DAMAGE INCLUDES DAMAGE TO THE FOLLOWING TYPES OF ITEMS: ELECTRICAL WORK. PLUMBING. MECHANICAL SYSTEMS. DOORS AND WINDOWS. FLOORS AND CEILINGS. FOUNDATIONS AND FOOTINGS. BUILT-IN SHELVES AND APPLICANCES. DECKS. FIREPLACES. AND GARAGS. AND OUTSIDE PROPERTY AND LANDSCAPING.

Q: WHEN WILL THE STUDY BE COMPLETED AND WHERE CAN I FIND OUT ABOUT THE STUDY'S RESULTS?

A: THE RESULTS OF THE STUDY SHOULD BE COMPLETED IN THE BEGINNING OF 1999 AND WILL BE POSTED ON THE DISTRICT'S WEB SITE (PROVIDE WEB ADDRESS).

SECTION A3: QUESTIONNAIRE MATERIALS-ENGLISH

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

Santa Clara Valley Water District
5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686

November 12, 1998

Dear ____________________:

Earlier this month, you agreed by phone to participate in an Army Corps of Engineers and Santa Clara Valley Water District study concerning the flooding of San Francisquito Creek on February 2 and 3 of this year. This study is being conducted in cooperation with the city governments of Palo Alto, East Palo Alto, and Menlo Park. Your responses to the enclosed survey questions will help us better determine the economic loss of these and other floods.

More specifically, your responses are important to us in the following ways:

- They will help your city government, the Santa Clara Valley Water District, and the Army Corps of Engineers understand impact of the flood disaster in your community.
- The increased understanding of flood losses we obtain from this survey will enable us to more accurately determine the benefits of flood damage reduction projects in your area and throughout the U.S.

If you have any questions or concerns about this study, please contact Dr. Katherine Cushing, the principal study investigator, at (650) 941-3474 or Kevin Knight, the Corps of Engineers representative, at (415) 977-8597. Your responses will be kept strictly confidential. The study report will not directly associate any information you provide with your name.

We encourage you to take the time necessary to complete the survey as completely and accurately as possible. Within the next seven days, please fill out the survey and return it to us in the enclosed self-addressed envelope. You may keep the Home Contents Flood Damage Worksheets packet for your own personal records. Thank you very much for your cooperation.

Sincerely,

MAS, EN
for Peter T. Grass
Lieutenant Colonel, Corps of Engineers
District Engineer

P. Kay Whitlock
P. Kay Whitlock
Assistant General Manager
Santa Clara Valley Water District

June Fleming
City Manager, City of Palo Alto

Monika Hudson
Interim City Manager, City of East Palo Alto

Janet M. Dolan
City Manager, City of Menlo Park

U.S. Army Engineer District, San Francisco
Corps of Engineers

Santa Clara Valley Water District

FEBRUARY 1998 FLOOD DAMAGE SURVEY

Thank you for participating in this study. The amount of time required to complete the survey will depend on how significantly your residence and your possessions were damaged by the flooding. It should take between 10 and 30 minutes to answer all the questions. If you kept any records of your flood-related expenses, having them handy will make it easier and faster to answer the questions.

Name ____________________

Address ____________________
____
____

Phone Number ____________________

Ages of all household members (including yourself) ____________________

Response code ____________________

THIS GROUP OF QUESTIONS CONCERNS ASSESSING FLOOD DAMAGES RELATED TO YOUR RESIDENCE AND YOUR POSSESSIONS. THESE QUESTIONS SHOULD ONLY APPLY TO FLOODING THAT OCCURRED OVER FEBRUARY 2 AND 3, 1998.

1. Did the February 1998 flooding damage, in any way, your residence's permanent structures, landscaping, possessions in your residence, or any vehicles located at your residence? (please check appropriate answer)

   ☐ Yes ☐ No

   If No, skip to Question 14.

2. Did the February flooding cause structural damage to your residence (e.g., flooring, plumbing, electrical work, or landscaping)? (please check appropriate answer)

   ☐ Yes ☐ No

   If No, skip to Question 7.

3. **STRUCTURAL DAMAGE TABLE**

In the table below, please fill out how much money you spent or will spend to replace, repair, and clean items in the following categories. Include repairs, cleaning, and replacements that are not yet completed. The information you provide does not need to be absolutely precise. If in doubt, make your best guess.

	Damage Category	Total cost of replacement, repair, and cleaning, including paid labor hours, supplies, etc. (dollars)
1	Electrical work (e.g., sockets, wiring)	
2	Plumbing (e.g., water heater, tap water system, sump pump, septic system)	
3	Mechanical (e.g., heat, air conditioning)	
4	Doors and windows	
5	Interior floors, carpets, and ceilings	
6	Foundation, footings, and crack repair	
7	Painting	
8	Built-in shelves and appliances	
9	Outbuildings, decks, fireplaces, and garages	
10	Outside property and landscaping	
11	Other (please describe)	
	TOTAL	

4. Approximately how many hours have you spent, or will you spend, replacing, repairing, and cleaning the items described in Question 3? Please take into account hours spent cleaning, purchasing cleaning supplies or replacement equipment, installing replacement equipment, filling out insurance forms, etc.

__________ (hours)

5. At the time of the flooding, did you have flood insurance coverage for structural damage? (please check appropriate answer)

☐ Yes ☐ No

If No, skip to Question 7.

6. How much in flood insurance payments did you or will you receive for the structural damage you described in Question 3?

__________ (dollars)

☐ Check here if insurance payment amount not yet determined

7. Household contents are the items within your residence that are not permanently attached to the building. Examples of contents include computers, rugs, dishwashers, and freestanding bookshelves. Did the February flooding damage any of your household contents? (please check appropriate answer)

☐ Yes ☐ No

If No, skip to Question 13.

In answering Questions 8. through 10., please refer to the Home Contents Flood Damage Worksheets packet included in this mailing. While it is not absolutely necessary to complete every worksheet in its entirety to answer this set of questions, the information you provide will be more accurate if you do. The completed worksheets may also be useful for insurance and tax purposes.

8. Approximately how much money did you spend or will you spend to replace household contents damaged by the February flooding?

__________ (dollars)

9. Approximately how much money did you spend or will you spend to repair and clean household contents damaged by the February flooding?

__________ (dollars)

10. Approximately how many hours have you spent or will you spend replacing, repairing, and cleaning household contents damaged by the February flooding? Please take into account hours spent cleaning, purchasing cleaning supplies or replacement contents, filling out insurance forms, etc.

__________ (hours)

11. At the time of the flooding, did you have flood insurance coverage for the contents of your residence? (please check appropriate answer)

☐ Yes ☐ No

If No, skip to Question 13.

12. How much in flood insurance payments did you or will you receive for the contents damage you described in Question 7?

__________ (dollars)

☐ Check here if insurance payment amount not yet determined

13. During the February 2 and 3 flooding …
    a) How many vehicles were located at this residence?

    _____ (no.of vehicles)

    If 0 entered above, skip to Question 14.

    b) How many of these vehicles were damaged by the flood?

    _____ (no.of vehicles)

    If 0 entered above, skip to Question 14.

        i) What was the total dollar cost to you for vehicle repair or replacement?

        __________ (dollars)

        ii) How much of the total dollar cost for vehicle repair or replacement was covered by insurance?

        __________ (dollars)

        iii) Besides the cost to repair or replace vehicle(s), how much have you or will you spend on other transportation-related expenses caused by the February flooding (e.g., rental car, mass transit)?

        __________ (dollars)

        iv) How much of the total dollar cost for these other transportation-related expenses cost was covered by insurance?

        __________ (dollars)

THIS GROUP OF QUESTIONS RELATES TO OTHER COSTS AND INCONVENIENCES YOU MAY HAVE INCURRED DUE TO THE FEBRUARY 2 AND 3, 1998 FLOODING.

14. During the flooding, did members of your household (including yourself) spend time in an emergency shelter? (please check appropriate answer)

☐ Yes ☐ No **If No, skip to Question 17.**

15. How many people in your household spent time in the emergency shelter?

_____ (no. of people)

16. How much time, in total, did all members of your household spend in the shelter?

_____ (days) _____ (hours)

17. Besides an emergency shelter, did any members of your household stay in temporary housing (e.g., friend or relative's home, apartment, hotel, motor home, etc.) due to any aspect of the February flooding? (please check appropriate answer)

☐ Yes ☐ No **If No, skip to Question 22.**

18. How many days did or will members of your household (including yourself) spend in a temporary residence due to the February flooding?

_____ (days)

19. How much money did your household spend, or will it spend, on temporary housing in excess of what you normally would have spent on housing?

__________ (dollars)

20. Due to living in temporary housing . . .

a) How much additional travel time was spent by all members of your household?

__________ (hours)

b) How many extra miles had to be driven on vehicles you own or lease?

__________ (miles)

21. Due to spending time in an emergency shelter or having to live in temporary housing, how much money did your household spend on food in excess of what you normally would have spent?

__________ (dollars)

22. Did any wage earners in your household (including yourself) miss any days of work due to all aspects of this year's flooding? (please check appropriate answer)

☐ Yes ☐ No

If No, skip to Question 25.

23. How many total days of work (including vacation days) were lost by all wage earners in this household due to all aspects of the February flooding?

_____ (total no. work days lost)

24. How many dollars in pay (including vacation pay) do you estimate were lost by all wage earners in this household due to all aspects of the February flooding?

__________ (dollars)

25. How much, if anything, did each of the following cost you in actual dollar expenditures due to the February flooding?

	Category	Cost (dollars)
a)	costs for moving furniture and other belongings	____________
b)	costs for storing furniture and other belongings	____________
c)	vandalism, looting, or theft costs	____________
d)	costs from flood-related medical problems	____________
e)	other flood-related costs (please specify)	____________

THIS GROUP OF QUESTIONS CONCERNS FLOOD AND RESIDENCE CHARACTERISTICS.

26. How high in feet and inches did the flood water get relative to the first floor elevation of your residence?

_____ (feet) _____ (inches) ☐ **above** ☐ **below** **FIRST FLOOR**
(check one)

27. Does your residence have a basement?

☐ Yes ☐ No **If No, skip to Question 30.**

28. Did water enter your basement due to the February flooding?

☐ Yes ☐ No **If No, skip to Question 30.**

29. Please provide the following information about your basement.

Does basement serve as living space? (e.g., bedroom, recreation room)	Basement height (i.e., distance from floor to ceiling) (feet, inches)	Maximum height of flood water in basement (feet, inches)
☐ Yes ☐ No		

30. How many hours, if any, did the flood water remain in your residence (not including mud, silt, or debris that may have been left behind after the flood waters receded)?

_____ (hours)

31. What type of structure do you reside in? (please check appropriate answer)

- ☐ one story building
- ☐ one and a half story building
- ☐ two story building
- ☐ mobile home or trailer
- ☐ high-raised structure (8 ft. or higher)
- ☐ apartment (living quarters on one level)
- ☐ condominium (living quarters on two or more levels)
- ☐ other (please specify) ______________________

32. At the time of the flooding, which of the following statements applied to you? (please check only one response)

- ☐ I owned and resided in this residence
- ☐ I was a tenant in this residence
- ☐ I was the property owner of this residence, but lived elsewhere
- ☐ Other (please specify) ______________________________

33. If there is anything else about your flood experience that you would like us to know about, please use the space below to write your comments.

Thank you very much for completing this survey. Please mail your completed survey in the enclosed postage paid envelope or send it to the principal study investigator, Dr. Katherine Cushing, at the following address:

990 Lundy Lane
Los Altos, CA 94024.

You may keep the Home Contents Flood Damage Worksheets for your own personal records.

FOR YOUR PERSONAL RECORDS
DO NOT RETURN

HOME CONTENTS FLOOD DAMAGE WORKSHEETS

U.S. Army Engineer District, San Francisco
Corps of Engineers

Santa Clara Valley
Water District

HOME CONTENTS FLOOD DAMAGE WORKSHEETS

The following worksheets will help you assess flood damages to possessions located in different areas of your residence (i.e., your home contents). Contents are items within your residence that are not permanently attached to the building. Please use these worksheets to describe damage to the items in your residence caused by the February 1998 flooding.

The worksheets are organized into the following categories: living room; dining room; kitchen and pantry; bedrooms; den, office, library, or family room; laundry, basement, and garage; entryway and hallways; bathroom and medical appliances; and other. On the next page is a Summary Worksheet that will help you add up your total monetary damages and hours spent replacing, repairing, and cleaning contents for all the rooms in your residence.

Instructions:
The simplest way for you to complete the worksheets is to walk through the rooms to which each worksheet(s) applies. For each item on the worksheets please indicate:

- The total number of each item damaged
- Dollar cost of replacing damaged items
- Dollar cost of repairing and cleaning damaged items
- Number of hours (other than paid labor hours) spent to repair or replace damaged items

The information you provide does not have to be absolutely precise. If in doubt, make your best guess. Please be sure to fill out every worksheet that contains items found in your house. If a damaged item is listed on a worksheet that is different from the worksheet for the room where the item is actually found in your house, put the requested information for that item on the worksheet for the room where the item is located in the "other" category and specify what the item is.

After you complete the room worksheets, complete the Summary Worksheet on page 3 using the 'TOTAL' information at the bottom of each room worksheet. Then, use the Summary Worksheet to fill out Questions 8, 9, and 10. on the survey. Keep the worksheets for your own records, all we need to have mailed back to us is the questionnaire.

Please note that your participation in this study is voluntary and confidential. You may refuse to provide any or all of the requested information.

Thank you very much for your cooperation.

SUMMARY WORKSHEET

Use the '**TOTAL**' row for each room worksheet to complete this worksheet.

Damage Category	Replacement Costs (dollars)	Repair and cleaning costs, including paid labor hours, supplies, etc. (dollars)	No. hours spent to repair, clean, or replace contents
1 Living room			
2 Dining room			
3 Kitchen and pantry			
4 Bedrooms			
5 Den, office, library, or family rooms			
6 Laundry room, basement, and garage			
7 Entryway and hallways			
8 Bathroom and medical appliances			
9 Other (please describe)			
TOTAL			
	Write the above amount in survey question 8.	Write the above amount in survey question 9.	Write the above amount in survey question 10.

LIVING ROOM

For each item described below, please provide the following information:

- The total number of item(s) damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your living room that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Un attached bookcase				
Books				
Couch				
Chair				
Table				
Lamp				
Curtains, drapes, and blinds				
Unattached carpet and rug				
Television set				
Stereo and video equipment				
CDs, videos, video games				
Pictures				
Antiques				
Piano				
Other				
	TOTAL			

DINING ROOM

For each item described below, please provide the following information:

- The total number of item(s) damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your living room that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Un attached buffet or bar				
Chair				
Table				
Lamp				
Unattached china cabinet				
China				
Glassware				
Silverware				
Curtains, drapes, and blinds				
Un attached carpet and rug				
Linens				
Other				
Other				
Other				
	TOTAL			

KITCHEN AND PANTRY

For each item described below, please provide the following information:

- The total number of item(s) damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your living room that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Fresh food and canned food				
Frozen food				
Liquor				
Refrigerator and freezer				
Microwave oven				
Chair				
Table				
Dishes and crockery				
China				
Glassware and crystal				
Silverware				
Knives and other cooking utensils				
Pans and other cookware				
Curtains, drapes, and blinds				
Appliances				
Lamp				
Other				
	TOTAL			

BEDROOMS

For each item described below, please provide the following information:

- The total number of each item damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your bedrooms that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Bed				
Boxspring and Mattress				
Bedding				
Bureau				
Table				
Lamp				
Chair				
Trunk or other storage unit				
Curtains, drapes, and blinds				
Unattached carpet and rug				
Pictures				
Television set				
Clothing and shoes				
Sports and hobby items				
Other				
	TOTAL			

DEN, OFFICE, LIBRARY, OR FAMILY ROOMS

For each item described below, please provide the following information:

- The total number of each item damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your bedrooms that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Un attached bookcase				
Books				
Couch				
Chair				
Table				
Lamp				
Curtains, drapes, and blinds				
Unattached carpet and rug				
Unattached bar				
Stereo equipment				
Television set				
Stereo and video equipment				
CDs, videos, video games				
Pictures				
Computer hardware				
Computer software				
Office equipment				
Office supplies				
Other				
	TOTAL			

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LAUNDRY, BASEMENT, AND GARAGE

For each item described below, please provide the following information:

- The total number of each item damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your bedrooms that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Chairs				
Tables				
Clothes washer and dryer				
Ironing equipment				
Refrigerator				
Freezer				
Luggage				
Hand tools				
Power tools				
Lawn and garden tools				
Work bench				
Barbeque equipment				
Sports and hobby items				
Clothing				
Other				
	TOTAL			

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ENTRYWAY AND HALLWAYS

For each item described below, please provide the following information:

- The total number of each item damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your bedrooms that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
Table				
Lamp				
Chair				
Unattached carpet and rug				
Coat rack				
Curtains, drapes, and blinds				
Clothing and shoes				
Pictures				
Antiques				
Other				
Other				
Other				
	TOTAL			

BATHROOM AND MEDICAL APPLIANCES

For each item described below, please provide the following information:

- The total number of each item damaged
- Dollar cost of replacing damaged item(s)
- Dollar cost of repairing and cleaning damaged item(s)
- Number of hours (other than paid labor hours) spent to repair, clean, or replace damaged item(s)

Items may have both repair and replacement costs. If there are items in your bedrooms that were damaged, but do not appear on this table, please note any damage to these items in the "other" category.

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
BATHROOM				
Medication				
Hygiene items				
Towels				
Bathroom appliances				
Cosmetics and perfumes				
Other bathroom items				
MEDICAL APPLIANCES				
Wheelchair				
Walker				
Other medical appliances				
	TOTAL			

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OTHER

Item Description	Total No. of Pieces Damaged	Replacement Costs (dollars)	Repair and Cleaning Costs, including paid labor hours (dollars)	Time Spent to Repair, Clean or Replace Damaged Items (hours)
	TOTAL			

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SANFRANCISCO
CORPS OF ENGINEERS
333 MARKET STREET, ___________
SAN FRANCISCO, CALIFORNIA 94105-2197

OFFICIAL BUSINESS

CA

US POSTAGE
$0.32
METER
8015566

Katherine Cushing, Ph.D.
990 Lundy Ln
Los Altos, CA 94024-5940

Please return by:

November 24!

SECTION A4: QUESTIONNAIRE MATERIALS-SPANISH

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

Santa Clara Valley Water District
5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686

November 12, 1998

Querido

A principios de este mes, usted acceptó por teléfono participar en un estudio que esta conduciendo el Army Corps of Engineers (ACE) junto con Santa Clara Valley Water District (SCVWD) sobre las inundacionas del Arroyo de San Francisquito del pasado 2 y 3 de Febrero. Este estudio se está llevando a cabo con la cooperación de los oficiales de Palo Alto, East Palo Alto y Menlo Park. Su respuesta al questionario aquí Incluida ayudará en determinar la pérdida económica ocasionada por estas y otras inundaciones.

Especificamente, sus respuestas seran de gran importancia de la siguiente manera:

- Ayudará al gobierno de su ciudad, a la Army Corps of Engineers y al Santa Clara Valley Water District comprender el impacto de los destrozos ocasionados por las inundaciones a su comunidaad.
- Entendiendo más las pédidas ocasionadas por las inundaciones (con la ayuda de este questionario), nos ayudará determinar con mayor precisión los beneficios de la reducción de proyectos para los daños de inundación no sólo de su área, si no tambíen del resto de los EEUU.

Si tiene alguna pregunta o duda sobre este estudio, por favor contacte la Dra. Katherine Cushing, la investigadora principal, al (650) 941-3474 o a Kevin Knight al (415) 977-8597. Sus respuestas serán estrictamente confidenciales, y los resultrados del estudio no asociará directamente la información que usted nos dió con su nombre.

Los alentamos a que llenen este questionario con calma para que altérmino de siete días, nos pueda mandar el questionario llenado usando el sobre pre-pagado que aquí le proveemos.

Sinceramente,

, MAJ, EN
for Peter T. Grass
Lieutenant Colonel, Corps of Engineers
District Engineer

P. Kay Whitlock
P. Kay Whitlock
Assistant General Manager
Santa Clara Valley Water District

June Fleming
June Fleming
City Manager, City of Palo Alto

Monika Hudson
Interim City Manager, City of East Palo Alto

Janet M. Dolan
City Manager, City of Menlo Park

QUESTIONARIO SOBRE LAS INUNDACIONES DE FEBRERO DE 1998

Muchas gracias por participar en este estudio. El tiempo que le llevará completar este questionarion dependerá de la gravedad de los daños a su vivienda y a sus pertenencias queocasionó las inundaciones. Le tomaria entre 10 a 30 minutos en contestar el questionario. Si mantuvo algún folio con los gastos relacionados a las inundaciones, le serán de gran ayuda para contestar las preguntas.

Nombre ______________________

Dirección ______________________
____
____

Número telefónico ______________________

Edades de todos, incluyéndose, de los miembros de su casa. ______________________

Survey Code ______________________

ESTE GRUPO DE PREGUNTAS SE REFIEREN A LOS DAÑOS A CAUSA DE LAS INUNDACIONES SOBRE SU VIVIENDA Y SUS PERTENENCIAS. ESTAS PREGUNTAS SOLO SON APLICABLES A LAS INUNDACIONES DEL 2 Y 3 DE FEBRERO DE 1998.

1. ¿Con las inundaciones de Febrero de 1998, tuvo algún tipo de daño esructural (por ejemplo, piso, alfombrado) a su vivienda, jardín, pertenencias en su residencia, o a algún vehículo ahí estacionado? (por favor marque la casilla adecuada)

   ☐Sí ☐No

   Si No, prosiga a la Pregunta 14.

2. ¿Las inundaciones de Febrero causaron daños estructurales (por ejemplo, piso, tubería, instalación eléctrica) a su vivienda? (por favor marque la casilla adecuada)

   ☐Sí ☐No

   Si No, prosiga a la Pregunta 7.

3. **TABLA DE DAÑOS ESTRUCTURALES**
STRUCTURAL DAMAGE TABLE
En la tabla siguente, por favor escriba el monto de dinero que gastó o gastará para reemplazar, reparar, y limpiar los artículos en las siguentes categorías.Incluyendo reparaciones, limpieza y reemplazos que todavía no hayan sido terminados. La información que nos proporcione no necesita ser absolutamente precisa. Si no está muy segura/o, aproxime lo más que pueda.

	Catergoría de Daños	Pago de reparaciones totales, limpieza, o reemplazo, incluyendo pago de por mano de obra, materiales, etc.(dólares)
1	Trabajo eléctrico (por ejemplo, cableado, interruptores)	
2	Tubería (por ejemplo, calentador de agua, agua de la llave, bomba de cisterna, systema antiséptico)	
3	Mecánicos (por ejemplo, calefacción, aire acondicionado)	
4	Puertas y ventanas	
5	Pisos interiores, alfrombra, y techos	
6	Cimientos, peraraciones de fracturas	
7	Pintura	
8	Estantes fijos y utensilios	
9	Construcciones externas, cubierta, chimeneas, garaje	
10	Propiedad externa y jardines	
11	Otro (describa por favor)	
	TOTAL	

4. ¿Aproximadamente cuántas horas a gastado o gastará en reemplazos, reparaciones, y limpieza de los puntos previamente mencionados en la Pregunta 3? Por favor, tome en consideración las horas que tomó limpiar, comprar materiales de limpieza o el quipo para los reemplazos, intalar estos reemplazos, llenar las planillas para la aseguranza, etc.

__________ (horas)

5. ¿Durante las inundaciones, tuvo alguna covertura de seguros en daños estructurales? (por favor marque la casilla adecuada)

☐Sí ☐No **Si No, prosiga a la Pregunta 7.**

6. ¿Cuánto, en pagos de la asuguranza pagos por inundaciones, obtuvo u obtenrá por los daños estructurales que describió en la Pregunta 3?

__________ (dólares)

☐ Marque aquí si los pagos de la aseguranza no han sido determinados

7. Artículos de la vivienda son aquellos que hay en su residencia que no están permanentemente parte de su vivienda. Ejemplos de éstos son computadoras, tapetes, lavavajillas y libreros movibles. ¿Tuvo daños a artículos de su vivienda a causa de las inindaciones de Febrero? (por favor marque la casilla adecuada)

☐Sí ☐No **Si No, prosiga a la Pregunta 13.**

Para contestar las Preguntas 8 al 10, guíese con el paquete de las Planillas de las Pertenencias Domésticas Dañadas a causa de la Inundación incluidas con el questionario. Aunque no sea necesario completar todas las planillas para contestar estas preguntas, las respuestas que Ud. dé serán más precisas. Por otro lado, las planillas le serán de gran uso para su seguros e impuestos.

8. ¿Aproximadamente cuánto dinero gastó o gastará por el reemplazo de los artículos de su casa que fueron dañados a causa de las inundaciones de Febrero?

__________ (dólares)

9. ¿Aproximadamente cuánto dinero gastó o gastará en reparar o limpiar los artículos de su casa que fueron dañados a causa de las inundaciones de Febrero?

__________ (dólares)

10. ¿Aproximadamente cuántas horas gastó o gastará por el reemplazo, reparación, y limpieza de los artículos de su casa que fueron dañados a causa de las inundaciones de Febrero? Por favor, tome en consideración las horas que tomó limpiar, comprar materiales de limpieza o el quipo para los reemplazos, intalar de estos reemplazos, llenar las planillas para la aseguranza, etc.

__________ (horas)

11. ¿Durante las inundaciones, los artículos de su vivivenda tenía covertura de seguro contra de inundaciones?

☐Sí ☐No **Si No, prosiga a la Pregunta 13.**

12. ¿Cuánto obtuvo u obtendrá del seguro contra inundaciones por los daños de los artículos de su casa que se refieren a la Pregunta 7?

__________ (dólares)

☐ Marque aquí si los pagos de la aseguranza no han sido determinados

13. Durante las inundaciones de Febrero 2 y 3 ...
    a) ¿Cuántos vehículos había en su residencia?

_____ (No.de vehículos) **Si escribió 0, vaya a la Pregunta 14.**

    b) ¿Cuántos de estos vehículos se dañaron a causa de las inundaciones?

_____ (No.de vehículos) **Si escribió 0, vaya a la Pregunta 14.**

        i) ¿Cuál fué el costo total en dólares que pagó por la reparación o reemplazo del vehículo?

__________ (dólares)

        ii) ¿Cuánto del costo total en dólares de la reparación o reemplazo a su vehículo fue cubierto por el suguro?

__________ (dólares)

        iii) Aparte del costo en reparar o reemplazar el/los vehículo/s a causa de las inundaciones de Febrero, cuánto pagó o pagará en otros gastos relacionados a transporte que resultaron de las mismas inundaciones (por ejemplo, renta de vehículo, gastos de transporte público)

__________ (dólares)

        iv) ¿Cuánto del costo total en dólares de los gastos relacionados al transporte fue cubierto por el seguro?

__________ (dólares)

ESTE GRUPO DE PREGUNTAS ESTAN RELACIONADAS A OTROS GASTOS QUE TUVO A CAUSA DE LAS INUNDACIONES DEL 2 Y 3 DE FEBRERO DE 1998.

14. Durante las inundaciones, tuvieron miembros de su casa y usted que quedarse en refugios?

☐Sí ☐No **Si No, prosiga a la Pregunta 17.**

15. ¿Cuántas personas (incluyéndose) tuvieron que hacer uso del refugio de emergencia?

_____ (No. de personas)

16. ¿Cuántas horas , en total, tuvieron que pasar en este regufio de emergencia?

_____ (días) _____ (horas)

17. ¿Aparte del refugio de emergencia, miembros de su casa (inlcuyéndose) tuvieron que quedarse en viviendas temporales (por ejemplo, casa de familiares o amistades, hotel, casa móViles? (por favor marque la casilla adecuada)

☐Sí ☐No **Si No, prosiga a la Pregunta 22.**

18. ¿Cuántos días pasaron o pasarán en una vivienda temporal a causa de las inundaciones de Febrero?

_____ (días)

19. ¿Cuánto dinero, si este fue el caso, tuvo que gastar o gastará en exceso, en comparación a lo que Ud. normalmente gasta, en las viviendas temporales a causa de las inundaciones de Febrero de 1998?

__________ (dólares)

20. A causa de pasar tiempo en el refugio de emergencia o por vivir en alguna vivienda temporal ...
    a) ¿Cuánto tiempo en exceso de tranporte tuvieron que gastar los miembros de su casa y Ud.?

    __________ (horas)

    b) ¿Cuántas millas extras tuvo que manejar en vehículos suyos o rentados?

    __________ (millas)

21. ¿A causa de pasar tiempo en el refugio de emeergencia o por vivir en alguna vivienda temporal, cuánto dinero tuvo, o tendrá, que gastar en exceso de comida a comparación a lo que normalmente gasta?

__________ (dólares)

22. ¿Algún miembro de la casa que está ganado un salario tuvo que perder algún día de trabajo por cualquier aspecto relacionado con las inundaciones de este año? (por favor marque la casilla adecuada)

☐Sí ☐No

Si No, prosiga a la Pregunta 25.

23. ¿En total, cuántos días de trabajo fueron perdidos por miembros de su casa que estén recibiendo un salario a causa de cualquier aspecto relacionado con las inundaciones de Febrero?

______ (No. total de días perdidos)

24. ¿Cuántos dólares de paga estima usted que los miembros que reciben salarios perdieron a causa de las inundaciones de Febrero?

__________ (dólares)

25. ¿Si hubo, cuánto fue el costo en dólares de los siguientes gastos a cuasa de las inundaciones de Febrero?

	Categoría	**Costa (dólares)**
a)	costo de mudanza de mobiliario y otras pertenencias	______________
b)	costo de almacenamiento de inmuebles y otras pertenencias	______________
c)	vandalismo, robo	______________
d)	costo médico relacionado con las inundaciones	______________
e)	otros costos relaciondos con las inundciones (por favor, especifique)	______________

ESTE GRUPO DE PREGUNTAS SE RELACIONAN A LAS CARACTERISTICAS DE LA INUNDACION.

26. ¿En comparación con la primera inundación, qué tan alto, en pies y pulgadas, alcanzó el nivel de agua?

_____ (pies) _____ (pulgadas) ☐**por arriba** ☐**por abajo** **PRIMER PISO**
(escoja una)

27. ¿Tiene sótano su residencia?

☐Sí ☐No **Si No, prosiga a la Pregunta 30.**

28. ¿Entró agua a su sótano a causa de las inundaciones de Febrero?

☐Sí ☐No **Si No, prosiga a la Pregunta 30.**

29. Por favor proporcione la siguiente información sobre su sótano.

Su sótano sirve como una parte activa de la casa (por ejemplo, recámara, cuarto de juego)	Altura del sótano (distancia del piso al techo en pies y pulgadas)	Altura máxima del nivel de que alcalzó el agua en pies y pulgadas
☐Sí ☐No		

30. ¿Cuántas horas permaneció el agua en su residencia (sin incluir lodo, residuos que se hayan quedado después que se bajo el nivel de agua)?

_____ (horas)

31. ¿En qué tipo de estructura vive usted? (por favor marque la casilla apropiada)

☐ edificio de un piso
☐ edificio de un piso y medio
☐ edificio de dos pisos
☐ casa móvil o trailer
☐ vivienda elevada (8 o más pies)
☐ apartamento (habitaciones en un solo nivel)
☐ condominio (habitaciones en dos o más niveles)

32. ¿Durante las inundaciones, cual de las siguientes frases le corresponde? (por favor marque solamente una casilla)

- ☐ fui dueño/a y recidí en esta vivienda
- ☐ fui un inquilino de esta vivienda (rentó)
- ☐ fui dueño/a de la vivienda, pero viví en otro lugar
- ☐ otro (por favor especifique) _________

33. Si existe algo más sobre su inundación que le gustaría hacernos saber, por favor use el espacio siguiente para escribir sus comentarios.

Muchas gracias por completar este questionario. Por favor mande el questionario completo en el sobre pre-pagado o mándelo a la investigadora principal, Dra. Katherine Cushing, a la siquiente dirección:

990 Lundy Lane
Los Altos, CA 94024.

Se puede quedar con las Planillas de las Pertenencias Domésticas Dañadas para su propio expediente.

PARA SU ARCHIVO
¡ NO DEVOLVER !

LISTA DE LOS CONTENIDOS DE LOS DAÑOS DEL INUNDACIÓN

LISTA DE LOS CONTENIDOS DE LOS DAÑOS DE LA INUNDACIÓN

Las siguentes listas ayudarán valorar los daños inundación en areas diferentes de la residencia. Contenidos son objetos dentro de su residencia que no permanente pegados del edifico. Favor de usar estas listas desribir daños a los objetos en su residncia causada por la inundación en febrero pasado.

Las listas están organizado en 1 siguente catagorías: la sala; el comedor; la cocina y despensa; el dormitorio; la guardida, oficina, bibioteca o sala de familiar; lavadora, sótano y garaje; entrada y pasillos; el baño y los aparatos médicos; y otras cosas. En la página próxima es una lista de tallada que lo ayudará asumar sus daños totales y las horas que perdió reponer, reparar, y limpiar objetos por todos los cuartos de su residencia.

Instucciónes:
La forma más fácil a completar la lista es caminar en cada cuarto que lista aplíque. Por cada objeto en la lista, favor de indicar:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

La información que pruebe no tiene que ser tan exacto. Si tiene duda, haga su mejor conjetuar. Favor de asegar complear cada lista que contiene objetos encontrado en su casa. Si un objeto dañado no aparece en la lista, agregarlo en la categoría "otra cosa."

Después de Ud. Complete la lista sumaria en la página 2, use el total de final de cada página de cada lista. Entonces, use la lista sumaria para completar preguntas 8, 9 y 10 en el questionario

Por favor note de su participación en el estudio es voluntaria y confidencial. Puede rehusar el contestar algunas o todas las preguntas.

Gracias por su cooperación.

LISTA SUMARIA

Use el '**TOTAL**' linea de cada cuarto para completar esta lista.

	Categoría de Daño	Valor de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
1	Sala			
2	Comedor			
3	Cocina y despensa			
4	Dormitorios			
5	Guardida, oficina, biblioteca o sala de familia			
6	Lavadora, sótano y garaje			
7	Entrada y pasillos			
8	Baños y los aparatos médicos			
9	Otra (favor de describir)			
	TOTAL			
		Escribe este total en el questionario pregunta 8	Escribe este total en el questionario pregunta 9	Escribe este total en el questionario pregunta 10

LA SALA

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Estante para libros				
Libros				
Cama				
Silla				
Mesa				
Lámpara				
Cortinas				
Alfombra				
Televisor				
Equipo de estereo y video				
Partidas del video, música				
Pinturas				
Antiguos				
Piano				
Otra cosa				
TOTAL				

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COMEDOR

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Bar				
Silla				
Mesa				
Lámpara				
Gabinete para porcelana				
Porcelana				
Vajilla de cristal				
Objetos de plata				
Cortinas				
Alfombra				
Lienzos				
Otra cosa				
Otra cosa				
Otra cosa				
TOTAL				

LA COCINA Y DEPENSA

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Comida fresa y comida enlatara				
Comida helada				
Licor				
Refrigerador				
Horno de micondas				
Silla				
Mesa				
Platos				
Porcelana				
Vajilla de cristal				
Objetos de plata				
Cuchillos				
Cacerolas				
Cortinas				
Aparato				
Lámpara				
Otra cosa				
TOTAL				

DORMITORIO

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Cama				
Colchón				
Colchónes y ropa de cama				
Escritorio				
Mesa				
Lámpara				
Silla				
Tronco				
Cortinas				
Alfombra				
Pinturas				
Televisor				
Ropa y zapatos				
Equipo de deportes				
Otra cosa				
TOTAL				

GUARIDA, OFICINA, BIBLIOTECA, O SALA DE FAMILIA

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en este cuarto, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Estatne para libros				
Libros				
Sofá				
Silla				
Mesa				
Lámpara				
Cortinas				
Alfombra				
Suelto barra				
Equipo de música				
Televisor				
Equipo de estereo y video				
Discos compactos, videos, y juegos electrónico				
Pinturas				
Computadoras				
Programas de computadora				
Equipo de oficina				
Provisiones de oficina				
Otra cosa				
TOTAL				

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LAVADORA, SÓTANO, Y GARAJE

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Silla				
Mesa				
Lavar y secar vestidos				
Equipo de planchar				
Refigerador				
Equipaje				
Instrumentos de manos				
Instrumentos de poder				
Instrumentos de césped y jardín				
Equipo de barbacoa				
Banco de trabajar				
Deportes y afición partida				
Ropa				
Otra cosa				
Otra cosa				
TOTAL				

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ENTRADA Y PASILLOS

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
Mesa				
Lámpara				
Silla				
Alfombra				
Chaqueta estante				
Cortinas				
Ropa y zapatos				
Pinturas				
Antiguos				
Otra cosa				
Otra cosa				
Otra cosa				
TOTAL				

EL BAÑO Y LOS APARATOS MÉDICOS

Para cada frace que descubre, favor de proveer la información:

- Suma de objetos dañados
- Valor de reponer los objetos dañados
- Valor de reparar y limpiar los objetos dañados
- Cuantas horas (otras de obrero) perdió reparar, limpiar o reponer objetos dañados

Los objectos poderíos tener ambos precios preparar y reponer. Si hay objetos en su cuarto de estar que fueron dañado, pero no aparecer en esta tablas, favor de marcar en la categoría "otra".

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
EL BAÑO				
Medicación				
Objetos higenicos				
Toallas				
Instrumentos del baño				
Cosmético y perfumes				
Otras cosas				
APARATOS MÉDICOS				
Sillada				
Silla para caminar				
Otros instumentos médicos				
TOTAL				

A-73

OTRAS COSAS

Descripción de objetos	Suma de pedazos dañados	Precio de reponer	Precio de reparar y limpiar (incluyendo obrero pagado)	El tiempo usado para reparar, limpiar, o reponer objetos dañados
TOTAL				

APPENDIX B
BUSINESS AND ORGANIZATION SURVEY METHODOLOGY AND SUPPORTING DOCUMENTATION

B1: METHODOLOGY
B2: QUESTIONNAIRE MATERIALS-ENGLISH
B3: QUESTIONNAIRE MATERIALS-SPANISH

SECTION B1
METHODOLOGY

The bulk of the work for this study was carried out from mid-November 1998 to mid-January 1999 by the principal investigator. This section presents detailed information on the implementation of each of the following steps.

1. Identify geographic areas containing businesses or other organizations believed to be impacted by the flooding.
2. Canvass geographic area to obtain background information
3. Prepare questionnaire materials
4. Distribute survey/questionnaire packets to businesses/organizations believed to be impacted by the flooding, either in person or by mail
5. Collect and input data from mail survey
6. Follow-up with businesses/organizations that did not return mail survey/questionnaire by phone
7. Compile and analyze data.

Step 1: Identify Geographic Areas Containing Affected Businesses and Organizations

Using the sources of information listed in Table B1 the project team identified general areas believed to contain the businesses and organizations most significantly impacted by the flooding. In addition, the project team also identified other businesses and organizations (i.e., not located in one particular area) that were probably affected by the flooding. For example, one set of organizations that were located in various areas, and were significantly affected by the flooding were identified using the ProCD database and its reverse search capabilities. In this case, streets located in the flooded area were input into the database and a query was performed to generate a list of businesses on those streets.

Table B1. Information Sources Used to Identify Businesses and Organizations

Data from interviews and personal communications
Physical tour of flooded area
Red Cross Damage Assessment Reports
ProCD Database
Local newspaper stories

Step 2: Canvass Geographic Area To Obtain Background Information

In step 2 of the study, the principal investigator personally visited or contacted by phone staff at each of the businesses and organizations believed to have been adversely impacted by the flooding. During these visits/phone conversations, staff was provided with the general purpose and objective of the study and the principal investigator made observations about the physical condition of the building. In addition, data was collected on the following: 1) whether or not the flooding impacted the business/organization and the extent of the impact, 2) whether or not staff would be willing to participate in further data collection, and 3) contact information (e.g., contact person, title, name of business/organization, mailing address, phone no.) for further data collection. All told, the principal investigator visited 71 businesses and organizations and made approximately 35 phone calls in the course of carrying out this step.

Step 3: Prepare Questionnaire Materials

In this step of the study, the principal investigator prepared a written questionnaire that asked business and organization staff for detailed information about their flood experience (e.g., structural damage caused by the flood, hours spent cleaning up and addressing other flood damage-related issues). The questionnaire was based largely on the questionnaire used for the survey of residents described in Appendix A and related questionnaires previously used by the Army Corps of Engineers. Section B2 in this appendix presents the questionnaire administered to participating businesses and organizations, along with detailed flood damage worksheets and a cover letter that accompanied the survey. The questionnaire materials were also translated into Spanish to facilitate the participation of primarily Spanish-speaking business and organization staff, and those documents are presented in Section B3 of this appendix.

Step 4: Distribute Questionnaire Material Packets

Once the questionnaire materials were finalized by the project team, enough copies were made to distribute to all the potentially affected businesses and organizations. Large mailing envelopes were electronically addressed and a return postage paid envelope was included in each packet. Most of the questionnaire packets were then hand-delivered to business and organization staff by the principal investigator. In certain cases (e.g., a coin-operated laundromat) where no staff were present, or when staff specifically requested that the questionnaire materials be mailed, the packets were mailed. In total, approximately 67 packets were distributed. The packets were delivered or mailed on December 15 and participants were asked to complete the questionnaire and return it in the postage paid envelope by December 22.

Step 5. Collect and Input Data from Mail Questionnaire

In the mailing packet, business and organization staff were instructed to complete the questionnaire and return in by postage paid envelopes. The return envelopes were addressed to the principal investigator by December 31, most of the written responses had come back. Completed questionnaire results were entered into an "Excel" computer spreadsheet for analysis. Unfortunately, the response was much less than anticipated. While 67 packets were distributed, only 14 were returned.[1] Due to the somewhat disappointing results achieved using the written questionnaire, the principal investigator decided to employ an alternative data collection technique, phone interviews.

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[1] One additional questionnaire was returned by a business in East Palo Alto whose owner was contacted as part of the residential survey. The owned requested an additional copy of the residential survey and used that form to provide information on his business damage.

Step 6: Follow-up with Phone Interviews

In order to increase the number of businesses and organizations participating in the study, the principal investigator personally called all the businesses and organizations that were given questionnaire materials, but had not returned them by the first week in January. In total, about 65 phone calls were made over a three day period, resulting in additional data collection for 21 businesses and organizations (15 in EPA, six in PA).[2] While the participating businesses and organizations did not answer all the questions in the written questionnaire, staff interviewed were able to provide at least some critical information about the floods affects. Examples of key data that was collected for these businesses and organizations included the following: 1) number of days the business or organization had to close due to all aspects of flooding, 2) estimated business loss, 3) estimated structural damage, 4) estimated contents damage, 4) estimated vehicle damage, 5) estimated other damage (e.g., clean up supplies and equipment, cost to pay employees for clean up time), 6) estimated number of hours required to respond to flood damage (e.g., clean up time, time required to fill out insurance forms, time required to purchase replacement contents). Information from phone interview data was transcribed and, when appropriate, entered into the 'Excel' spreadsheet containing information from returned written questionnaires.

While significant measures were taken to maximize the response rate (e.g., personally contacting staff at the businesses and organizations, hand delivering the questionnaire), the response rate for the East Palo Alto businesses and organizations was not high. When non-respondents were later called during a follow-up effort, staff replied that they had been busy with other things and had not had time to complete the survey. Since the surveys were distributed in mid-December, which is the busiest retail time of the year, the timing of distribution may have contributed to the low response rate. Also, the length and level of detail of the survey might have made the survey seem difficult to complete, further contributing to the low response rate. Third, a significant number of business were staffed by primarily Spanish speaking personnel, and although the written survey materials were translated into Spanish, it was difficult for the principal investigator to communicate in person with Spanish speaking staff as to the nature and purpose of the study.

Future surveys of this type might try a different approach , such as face-to-face interview, to collect similar data in the future. Also, the investigation took place long after the flood event had actually occurred (approximately 9 to 10 months), and that might have made it difficult for some business owners who simply did not keep detailed or separate records of their flood damage to go back to old records and look up information.

Additionally, other unavoidable factors contributed to East Palo Alto's marginal participation rate. Many of the structures damaged by the flooding—14 out of 56 (25%) did not house operational businesses (i.e., they were abandoned). Therefore, it was extremely difficult to collect information on them. Also, several of the operational businesses that were contacted in the initial stages of data collection went out of business or moved to other locations in later stages of data collection.

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[2] According to some telephone interviews, businesses that were thought to have some economic impact reported not suffering any adverse economic impacts. Therefore, there was no loss data for these organizations. This difference accounts for having information for more organizations than all the organizations believed to impacted by the flooding.

Step 7: Compile and Analyze Data

Table B2 below summarizes the results of the main data collection methods used for this portion of the study. It shows that in total, data was collected for approximately 39 business and organizations.

Table B2. Survey and Phone Interview Response Data

City	Location/ Description	No. Surveys Distributed	No. Surveys Returned	No. of Bus/Org with phone interview data	Total No. Bus/Org. have some data**
PA	Edgewood	10	1	5	6
	Embarc./Bayshore	8	6	1	7
	School	1	0	1	1
	SUBTOTAL				14
EPA	Whiskey Gulch	38	4	15	19
	Apt. Complex	9	0	6	5
	Bayshore*	1	1	1	1
	SUBTOTAL				25

* Owner used residential survey to record business damage

** Includes both organizations that reported adverse economic impacts as well as organizations that reported no business losses or damage

Once it was determined that no more businesses and organizations were likely to provide information, the data entered into the 'Excel' spreadsheet was analyzed to determine the overall economic impact of the flooding. In carrying out this part of the investigation, the following procedures and calculations were used:

For business losses:

- Create separates spreadsheet containing reported business losses for businesses in East Palo Alto and Palo Alto
- Where possible, estimate business losses for businesses that did not participate in the study.
- Assign non-recoverable loss percentages to the various kinds of businesses represented by the study sample
- Calculate estimated net business loss for each business believed to be affected by the flooding (net business loss = total business loss * non-recoverable loss percentage)
- For each city (i.e., East Palo Alto and Palo Alto), sum the net business losses.

Tables B3 and B4 below present the business loss spreadsheet used to calculate business losses for East Palo Alto and Palo Alto.

Table B3. Estimated Net Business Loss: East Palo Alto

	Description	Est. Business Loss*	% Loss Unrecoverable	Est. Net Business Loss	Data Source	Comments
1	Health and Beauty	$500	0.5	$250	ESTIMATE	
2	Food-take out (Taq)	$500	0.75	$375	ESTIMATE	
3	Real Estate	NAP	NAP	NAP	NONE	REFUSED TO PARTICIPATE
4	Liquor store	$1,400	0.75	$1,050	ESTIMATE	
5	Health and Beauty	$500	0.5	$250	ESTIMATE	
6	Bar/Night club	$4,000	1	$4,000	REPORTED	PROBABLY CLOSED 3 DAYS
7	Bar/Night club	$4,000	1	$4,000	REPORTED	PROBABLY CLOSED 3 DAYS
8	Bar/Night club	$4,000	1	$4,000	ESTIMATE	ESTIMATE
9	Liquor store	$1,800	0.75	$1,350	REPORTED	PROBABLY CLOSED 3 DAYS
10	Food-take out (Popeye's)	$500	0.75	$375	ESTIMATE	ESTIMATE
11	Auto Car Wash	$200	0.5	$100	ESTIMATE	ESTIMATE
12	Convenience store	$500	0.5	$250	ESTIMATE	ESTIMATE
13	Coin-op Laundromat	$200	0.5	$100	ESTIMATE	ESTIMATE
14	Food-take out (Taq)	$500	0.5	$250	ESTIMATE	ESTIMATE
15	Liquor store	$1,000	0.75	$750	REPORTED	PROBABLY CLOSED 3 DAYS
16	Grocery	$2,000	0.75	$1,500	ESTIMATE	ESTIMATE
17	Hardware	$2,500	0.5	$1,250	REPORTED	CLOSED 3 DAYS
18	Jewelry	$500	0.5	$250	ESTIMATE	CLOSED 2 DAYS
19	Music	$20,000	0.5	$10,000	REPORTED	PROBABLY CLOSED 3 DAYS
20	Food-take out	$500	0.75	$375	ESTIMATE	ESTIMATE
21	Health and Beauty	$500	0.5	$250	REPORTED	CLOSED 3 DAYS
22	Food-take out (Taq)	$500	0.5	$250	ESTIMATE	PROBABLY CLOSED 3 DAYS
23	Health and Beauty	$500	0.5	$250	ESTIMATE	PROBABLY CLOSED 3 DAYS
24	Video	$500	1	$500	ESTIMATE	PROBABLY CLOSED 3 DAYS
25	Other-service (fast cash)	$500	0.5	$250	ESTIMATE	PROBABLY CLOSED 3 DAYS
26	Food-take out	$4,000	0.75	$3,000	REPORTED	CLOSED 3 DAYS
27	Liquor store	$1,000	0.75	$750	ESTIMATE	PROBABLY CLOSED 3 DAYS
28	Other-service					
29	Apartment complex corp					
30	Apartment complex					
31	Apartment complex					
	TOTAL		$52,600	$35,725		

NAP = Not applicable

Table B4. Estimated Net Business Loss: Palo Alto

	Description	Est. Business Loss	% Loss Unrecoverable	Est. Net Business Loss	Data Source	Comments
1	Gas station	$500	1	$500	ESTIMATED	CLOSED 1/2 DAY
2	Coin-op Laundromat	$0	NAP	$0	REPORTED	CLOSED 1 DAY
2	Clothing	$200	0.5	$100	ESTIMATED	CLOSED 1 DAY
3	Liquor store	$150	0.75	$113	ESTIMATED	CLOSED 1 DAY
4	Shoe repair	$1,500	0.5	$750	REPORTED	CLOSED 1 DAY
5	Health and Beauty	$700	0.5	$350	REPORTED	CLOSED 1 DAY
6	Deli	$200	0.75	$150	ESTIMATED	CLOSED 1 DAY
7	Grocery	$2,000	0.75	$1,500	REPORTED	CLOSED 1 DAY
8	Fed Post Office	$15,000	0.5	$7,500	REPORTED	NOT CLOSED
9	Auto repair (body)	$20,000	0.5	$10,000	REPORTED	CLOSED 5 DAYS
10	Auto repair (upholstery)	$30,000	0.5	$15,000	REPORTED	CLOSED 2 MONTHS
11	Garden	$20,000	0.5	$10,000	REPORTED	CLOSED 5 DAYS
12	Other-service (flying club)	$1,000	0.5	$500	REPORTED	CLOSED FOR 5 DAYS
13	Storage	$4,000	0.5	$2,000	ESTIMATED	PROBABLY CLOSED FOR 5 DAYS
14	Golf Course	$68,000	1	$68,000	REPORTED	CLOSED 1 DAY
15	Apartment	$0	NAP	$0	REPORTED	
	TOTAL	$163,250		$116,463		

NAP = Not applicable

For Business and Organization Damage:

- Create separates spreadsheet containing reported damage (i.e., structural, contents, vehicle, and other) losses for businesses and organizations in East Palo Alto and Palo Alto.
- Where appropriate, estimate business damage for businesses that did not participate in the study.[3]
- Calculate estimated total business and organization damage individually by summing the various categories of damage.[4]
- Calculate estimated total business and organization loss for each city by summing the damage values for each business organization.

Tables B5 and B6 below present the business and organization damage spreadsheets used to calculate business losses for East Palo Alto and Palo Alto.

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[3] No estimations were performed for organizations that did not participate in the study.

[4] Some businesses and organizations did not separate out the various kinds of damage by category. Rather, they simply provided a total damage figure.

Table B5. Business and Organization Damage: East Palo Alto

		Description	Dam-Struct	Dam-Cont	Dam-Veh	Dam-Oth	Est. Total Damage	Data Source
BUS-DAMAGE	1	Health and Beauty					$500	ESTIMATE
	2	Food-take out (Taq)					$500	ESTIMATE
	3	Real Estate					$500	ESTIMATE
	4	Liquor store					$500	ESTIMATE
	5	Health and Beauty					$500	ESTIMATE
	6	Bar/Night club					$650	REPORTED
	7	Bar/Night club					$650	REPORTED
	8	Bar/Night club					$650	ESTIMATE
	9	Liquor store		$5,800		$1,000	$6,800	REPORTED
	10	Food-take out (Popeye's)					$500	ESTIMATE
	11	Auto Car Wash					$0	
	12	Convenience store					$0	
	13	Coin-op Laundromat					$0	
	14	Food-take out (Taq)					$500	ESTIMATE
	15	Liquor store		$11,000		$800	$11,800	REPORTED
	16	Grocery					$500	ESTIMATE
	17	Hardware	$300	$2,000		$600	$2,900	REPORTED
	18	Jewelry					$0	
	19	Music		$10,000			$10,000	REPORTED
	20	Food-take out					$0	
	21	Health and Beauty	$1,200	$1,000		$300	$2,500	REPORTED
	22	Food-take out (Taq)		$300		$600	$0	
	23	Health and Beauty					$0	
	24	Video					$0	
	25	Other-service (fast cash)					$0	
	26	Food-take out		$300		$600	$900	REPORTED
	27	Liquor store					$0	
	28	Other-service	16500	40000	$460	10000	$66,960	REPORTED
	29	Apartment complex corporation					$300,000	REPORTED
	30	Apartment complex					$5,000	ESTIMATE
	31	Apartment complex					$5,000	ESTIMATE
		SUBTOTAL					$417,810	
ORG-DAMAGE	1	Non-profit-entrepreneurial		$2,000			$2,000	
	2	Non-profit-entrepreneurial		$200			$200	
	3	Non-profit computer		$30,000			$30,000	
	4	Non-Profit community assistance					$0	
	5	Non-Profit community assistance	$3,000	$6,300			$9,300	
	6	Non-Profit community assistance						
		SUBTOTAL					$41,500	
		TOTAL					$459,310	

Table B6. Business and Organization Damage: Palo Alto

		Description	Dam-Struct	Dam-Cont	Dam-Veh	Dam-Oth	Est. Total Damage	Data Source	Comments
BUS-DAMAGE	1	Gas station					$0	REPORTED	
	2	Coin-op Laundromat					$0	ESTIMATE	
	3	Clothing					$0	REPORTED	
	4	Liquor store					$0	REPORTED	
	5	Shoe repair					$0	REPORTED	
	6	Health and Beauty					$0	REPORTED	
	7	Deli					$0	REPORTED	
	8	Grocery					$0	REPORTED	
	9	Federal Post Office					$0	REPORTED	
	10	Auto repair (body)		15000		8300	$23,300	REPORTED	
	11	Auto repair (upholstery)	15000	10000		5000	$30,000	REPORTED	
	12	Garden	1150	15800		11860	$28,810	REPORTED	
	13	other-service (flying club)					$0	REPORTED	
	14	Storage					$10,000	ESTIMATE	
	15	Golf Course		$500			$500	REPORTED	See Municipal Impact Section
	16	Apartment complex	21622	11700		3635	$36,957	REPORTED	
	17	Airport	25000				$25,000	REPORTED	
		SUBTOTAL					$154,567		
ORG-DAMAGE	1	Elementary School					$60,000	REPORTED	
		TOTAL					$214,567		

SECTION B2: QUESTIONNAIRE MATERIALS-ENGLISH

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

Santa Clara Valley Water District
5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686

December 11, 1998

Dear ______________________:

Several weeks ago, you agreed to participate in an Army Corps of Engineers and Santa Clara Valley Water District study concerning the flooding of San Francisquito Creek that occurred on February 2 and 3 of this year. This study is being conducted in cooperation with the city governments of Palo Alto, East Palo Alto, and Menlo Park. Your responses to the enclosed survey questions will help us better determine the economic loss of this and other floods.

More specifically, your responses are important to us in the following ways:

- They will help your city government, the Santa Clara Valley Water District, and the Army Corps of Engineers understand the economic impact of the flood disaster in your community.
- The increased understanding of flood losses we obtain from this survey will enable us to more accurately determine the benefits of flood damage reduction projects in your area and throughout the U.S.

If you have any questions or concerns about this study, please contact Dr. Katherine Cushing, the principal study investigator, at (650) 941-3474 or Kevin Knight, the Corps of Engineers representative, at (415) 977-8597. Your responses will be kept strictly confidential. The study report will not directly associate any information you provide with your name or the name of your business or organization.

We encourage you to take the time necessary to complete the survey as completely and accurately as possible. Within the next seven days, please fill out the survey and return it to us in the enclosed postage paid envelope. You may keep the Flood Damage Worksheets packet for your own personal records. Thank you very much for your cooperation.

Sincerely,

P. Kay Whitlock

Peter T. Grass
Lieutenant Colonel, Corps of Engineers
District Engineer

P. Kay Whitlock
Assistant General Manager
Santa Clara Valley Water District

U.S. Army Engineer District, San Francisco
Corps of Engineers

Santa Clara Valley Water District

FEBRUARY 1998 FLOOD DAMAGE SURVEY

Thank you for participating in this study. The amount of time required to complete the survey will depend on how significantly your business or organization was affected by the flooding. It should take between 10 and 20 minutes to answer all the questions. If you kept any records of your flood-related expenses, having them handy will make it easier and faster to answer the questions.

Name ______________________________

Business/Organization Name ______________________________

Business/Organization Address ______________________________
____
____

Phone Number ______________________________

No. of Full Time Employees ______________________________

Response Code (do not fill out) ______________________________

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1. Which one of the following categories best describes your business/organization? (please check only one box)

☐ a. Restaurant/food
☐ b. Grocery
☐ c. Liquor
☐ d. Drug store/pharmacy
☐ e. Convenience store
☐ f. Auto repair
☐ g. Hardware
☐ h. Health and Beauty
☐ i. Bar/nightclub
☐ j. Garden supply
☐ k. Non-profit
☐ l. Apartment complex
☐ m. Real estate
☐ n. Audio/video
☐ o. Dry cleaning/laundry
☐ p. Clothing
☐ q. Other-retail (describe) ______________________
☐ r. Other-service (describe) ______________________

2. At the time of the flooding, did your business/organization own, rent, or lease the building you are in? (please check only one response)

☐ a. Own
☐ b. Rent or lease
☐ c. Other (please specify) ______________________________

3. If you rented or leased this building, could you please tell us who the owner is?

Name	
Address	
Phone Number	

In answering the Questions 4, 5, and 6, please refer to the Business/Organization Flood Damage Worksheets packet included in this mailing. While it is not absolutely necessary to complete every worksheet in its entirety to answer this set of questions, the information you provide will be more accurate if you do. The completed worksheets may also be useful for insurance and tax purposes.

4. Approximately how much money did you spend or will you spend to repair structural damage (e.g., damage to flooring, plumbing, electrical work, etc.) to your building caused by the February 1998 flooding? (SEE WORKSHEET 1: STRUCTURAL DAMAGE FOR DETAILS)

__________ (dollars)

5. Contents are items within your building that are not permanently attached to it. Examples of contents include computers, rugs, books, and freestanding bookshelves. Approximately how much money did you spend or will you spend to replace or repair contents damage to your business/organization caused by the February 1998 flooding? (SEE WORKSHEET 2: CONTENTS DAMAGE FOR DETAILS)

__________ (dollars)

6. Approximately how much money did your business/organization spend or will it spend on other flood damage-related costs (e.g., 'out of pocket cost' for debris removal, cleaning) caused by the February 1998 flooding? (SEE WORKSHEET 3: OTHER FLOOD-DAMAGE RELATED COSTS FOR DETAILS)

__________ (dollars)

7. At the time of the flooding, did your business/organization have flood insurance coverage for structural damage? (please check appropriate answer)

   ☐ Yes ☐ No

   If No, skip to Question 9.

8. How much in flood insurance payments did you or will you receive for the structural damage you described in Question 4?

   a. __________ (dollars)

   ☐ b. Check here if insurance payment amount not yet determined

9. At the time of the flooding, did your business/organization have flood insurance coverage for contents damage? (please check appropriate answer)

   ☐ Yes ☐ No

   If No, skip to Question 11.

10. How much in flood insurance payments did you or will you receive for the contents damage you described in Question 5 ?

    a. __________ (dollars)

    ☐ b. Check here if insurance payment amount not yet determined

11. How many days, if any, was this business/organization closed due to the February flooding?

    __________ (days)

12. Approximately how much income (e.g., sales, rent), if any, did your business/organization lose as a result of the February flooding?

    __________ (dollars)

13. What is the average February income for this business/organization?

__________ (dollars)

14. Approximately how many hours have you and your employees spent, or will you spend, replacing, repairing, and cleaning the items damaged by the February flooding? Please take into account hours spent cleaning, purchasing cleaning supplies or replacement equipment, installing replacement equipment, filling out insurance forms, etc.

__________ (hours)

15. Were any vehicles located at this building damaged by the February flood?

☐ Yes ☐ No

If No, skip to Question 18.

16. How many vehicles located at this building were damaged by the flood?

____

17. Please provide the following information about vehicles located at this building that were damaged by the flood.

a.	Total dollar cost for vehicle repair or replacement	____________ (dollars) ☐ check here if don't know
b.	Amount of vehicle repair or replacement cost covered by insurance	____________ (dollars) ☐ check here if don't know
c.	Cost of other transportation-related expenses caused by the February flooding (e.g., rental car, mass transit)	____________ (dollars) ☐ check here if don't know
d.	Amount of other transportation-related expenses covered by insurance	____________ (dollars) ☐ check here if don't know

18. How high in feet and inches did the flood water get relative to the first floor elevation of your building?

_____ (feet) _____ (inches) ☐**above** ☐**below** **FIRST FLOOR**
(check one)

19. How many hours, if any, did the flood water remain in your building (not including mud, silt, or debris that may have been left behind after the flood waters receded)?

_____ (hours)

20. If there is anything else about your flood experience that you would like us to know about, please use the space below to write your comments. If you need more space, please feel free to use the back side of this page.

Thank you very much for completing this survey. Please mail your completed survey in the enclosed postage paid envelope or send it to the principal study investigator, Dr. Katherine Cushing, at the following address: 990 Lundy Lane Los Altos, CA 94024. You may keep the Business/Organization Flood Damage Worksheets for your own personal records.

FOR YOUR PERSONAL RECORDS
DO NOT RETURN

BUSINESS/ORGANIZATION

FLOOD DAMAGE WORKSHEETS

U.S. Army Engineer District, San Francisco
Corps of Engineers

Santa Clara Valley
Water District

BUSINESS/ORGANIZATION FLOOD DAMAGE WORKSHEETS

Please use these worksheets to describe damage to your building and your business'/organizations' possessions damaged by the February 1998 flooding. The worksheets are organized into the following categories: structural damage, contents damage, and other flood damage-related costs.

The information you provide does not have to be absolutely precise. If in doubt, make your best guess. After you complete Worksheets 1, 2, and 3, use the 'TOTAL' information at the bottom of each worksheet to fill out Questions 4, 5, and 6 on the survey. Keep the worksheets for your own records, all we need to have mailed back to us is the questionnaire.

Please note that your participation in this study is voluntary and confidential. You may refuse to provide any or all of the requested information.

Thank you very much for your cooperation.

WORKSHEET 1: STRUCTURAL DAMAGE

	Damage Category	Cost of replacement, repair, and cleaning, including paid labor hours, supplies, etc. (dollars)
1	Electrical work	
2	Plumbing	
3	Mechanical	
4	Doors and windows	
5	Floors and floor covering	
6	Walls, ceilings, and insulation	
7	Foundation, footings, and crack repair	
8	Painting	
9	Built-in shelves and appliances	
10	Outbuildings and garages	
11	Outside property and landscaping	
12	Parking and walkways	
13	Docks and loading facilities	
14	Other	
15	Other	
16	Other	
17	Other	
18	Other	
	TOTAL	
		Write above amount in Survey Question 4

WORKSHEET 2: CONTENTS DAMAGE

	Damage Category	**Cost of replacement and repair (dollars)**
1	Appliances	
2	Table	
3	Lamp	
4	Chair	
5	Couch	
6	Rug/carpet	
7	Television	
8	Stereo/video equipment	
9	Refrigerator and freezer	
10	Glassware	
11	Silverware	
12	Linens	
13	Curtains	
14	China	
15	Display cases, counters, and bins	
16	Merchandise	
17	Parts/raw materials	
18	Fresh food/frozen food	
19	Inventory	
20	Other	
21	Other	
	TOTAL	
		Write above amount in Survey Question 5

WORKSHEET 3: OTHER FLOOD DAMAGE-RELATED COSTS

	Damage Category	**Cost (dollars)**
1	Removal of debris and damaged items	
2	Cleaning and disinfection	
3	Pumping and drying	
4	Replacement of records	
5	Additional or alternative operating costs	
6	Moving furniture and other belongings	
7	Storing furniture and other belongings	
8	Vandalism, looting, or theft costs	
9	Flood-related medical problems	
10	Other flood-related costs	
11	Other	
12	Other	
13	Other	
14	Other	
15	Other	
16	Other	
17	Other	
18	Other	
19	Other	
20	**TOTAL**	
		Write above amount in Survey Question 6

SECTION B3: QUESTIONNAIRE MATERIALS-SPANISH

DEPARTMENT OF DEFENSE UNITED STATES OF AMERICA

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

Santa Clara Valley Water District
5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686

11 de Diciembre de 1998

Querido/a Sr. Magana:

En semanas pasadas, usted acceptó participar en un estudio que esta conduciendo el Army Corps of Engineers (ACE) junto con Santa Clara Valley Water District (SCVWD) sobre las inundaciones del Arroyo de San Francisquito del pasado 2 y 3 de Febrero. Este estudio se está llevando a cabo con la cooperación de los oficiales de Palo Alto, East Palo Alto y Menlo Park. Su respuesta al questionario aquí incluida ayudará en determinar la pérdida económica ocasionada por estas y otras inundaciones.

Especificamente, sus respuestas seran de gran importancia de la siguiente manera:

- Ayudará al gobierno de su ciudad, a la Army Corps of Engineers y al Santa Clara Valley Water District comprender el impacto de los destrozos ocasionados por las inundaciones a su comunidad.
- Entendiendo más las pérdidas ocasionadas por las inundaciones (con la ayuda de este questionario), nos ayudará determinar con mayor precisión los beneficios de la reducción de proyectos para los daños de inundación no sólo de su área, si no también del resto de los EEUU.

Si tiene alguna pregunta o duda sobre este estudio, por favor contacte a la Dra. Katherine Cushing, la investigadora principal, al (650) 941-3474 o a Kevin Knight, representatne del Cuerpo de Ingenieros, al (415) 977-8597. Sus respuestas serán estrictamente confidenciales, y los resultados del estudio no asociará directamente la información que usted nos dió con su nombre o el nombre de su compañía o su organización.

Les estamos preguntando que llenen este questionario con calma y los más correcto posible. Dentro de los próximos siete días, favor de mandar el questionario completo usando el sobre pre-pagado incluido para su uso. Muchas grácias por su participación y su cooperación.

Sinceramente,

Peter T. Grass
Teniente Coronel, Cuerpo de Ingenieros
del Distrito de Ingermieria

P. Kay Whitlock

P. Kay Whitlock
Asistente del Gerente General
del Santa Clara Valley Water District

QUESTIONARIO SOBRE LAS INUNDACIONES DE FEBRERO DE 1998

Muchas gracias por participar en este estudio. El tiempo que le llevará completar este questionarion dependerá de la gravedad de los daños a su vivienda y a sus pertenencias queocasionó las inundaciones. Le tomaría entre 10 a 20 minutos en contestar el questionario. Si mantuvo algún folio con los gastos relacionados a las inundaciones, le serán de gran ayuda para contestar las preguntas.

Nombre ______________________________

Nombre de Negocio/Organización ______________________________

Dirección de Negocio/Organización ______________________________
____
____

Número telefónico ______________________________

Numero de empleados de tiempo completo ______________________________

Survey Code ______________________________

---

1. ¿Cuál de las siguientes categorias describe mejor su negocio/organización? (Por favor marque solo una casilla)

☐ a. Restaurante
☐ b. Tienda de comestibles
☐ c. Licoreria
☐ d. Farmacia
☐ e. Tienda de convenencia
☐ f. Reparación de autos
☐ g. Ferreteria
☐ h. Bellesa y salud
☐ I. Club nocturno
☐ j. Abastecimientos de jardineria
☐ k. Organización sin ganancia
☐ l. Apartamentos
☐ m. Inmobiliario de fincas
☐ n. Audio/video
☐ o. Tintoreria/lavanderia
☐ p. Tienda de ropa
☐ Otro-Venta al por menor(describa)
____
☐ r. Otro-Servicios (describa)
____

2. ¿Al tiempo de la inundacion, su negocio/organización poseía, rentaba, o arrendaba el edificio en el que está? (Por favor marque solo una respuesta)

☐ a. Poseía
☐ b. Rentaba o arrendaba
☐ c. Otro (por favor especifique) ______________________________

3. ¿Si está rentaba o arrendondo este edificio, nos pudiera decir quién es el dueño.

Nombre	
Dirección	
Número telefónico	

Al contestar las preguntas 4,5, y 6, por favor use de referencia el paquete **"FORMULARIO DE DAÑOS POR INUNDACION DE NEGOCIOS/ORGANIZACIÓNES"** que está incluido en esta correspondencia. Aunque no es absolutamente necesario completar cada formulario completamente para responder estas preguntas, la información que usted provea sera mas exacta si lo hace. Los formularios completos pueden ser conveniente para propositos de aseguransa y impuestos.

4. ¿Aproximadamente cuánto dinero gastó o gastará para reparar el daño estructural (por ejemplo, daño al piso, plomeria, trabajo electrico, etc.) a su edificio causado por la inundacion de Febrero 1998? (Mire el Formulario 1: Daño Estructural por detalles.)

_______________ (dólares)

5. Contenido son cosas en su edificio que no son parte del edificio. Ejemplos de contenido inclulle computadoras, alfombra, libros, y estantes para libros que se sostienen solos. ¿Aproximadamente cuánto dinero gasto o gastara para reparar el contenido dañodo de su negocio/organización causado por la inundacion de Febrero 1998? (Mire el Formulario 2: Daño a Contenido por detalles.)

_______________ (dólares)

6. ¿Aproximadamente cuánto dinero gastó o gastará su negocio/organización en otros costos relacionados a los daños de la inundacion (Ejemplo; 'dinero de su bolsillo' para remover restos, limpiar) causados por la inundacion de Febrero 1998? (Mire el Formulario 3: Otro Costos Relacionados al Daño Causado por las Inundaciones por detalles).

_______________ (dólares)

7. ¿Durante las inundaciones, tuvo alguna covertura de seguros en daños estructurales? (por favor marque la casilla adecuada)

☐ Sí ☐ No **Si No, prosiga a la Pregunta 9.**

8. ¿Cuánto, en pagos de la asuguranza pagos por inundaciones, obtuvo u obtenrá por los daños estructurales que describió en la Pregunta 4?

__________ (dólares)

☐ Marque aquí si los pagos de la aseguranza no han sido determinados

9. ¿Durante las inundaciones, los artículos de su vivivenda tenía covertura de seguro contra de inundaciones?

☐ Sí ☐ No **Si No, prosiga a la Pregunta 11**

10. ¿Cuánto obtuvo u obtendrá del seguro contra inundaciones por los daños de los artículos de su casa que se refieren a la Pregunta 5?

__________ (dólares)

☐ Marque aquí si los pagos de la aseguranza no han sido determinados

11. ¿Cuántos días, si alguno, estubo este negocio/organización cerrado por causa de la inundacion de febrero?

_______________ (días)

12. ¿Aproximadamente cuántos ingresos (por ejemplo; ventas, renta), si algunos, perdió su negocio/organización como resultado de la inundacion de febrero?

_______________ (dólares)

13. ¿Cuál es el promedio de ingresos para el mes de Febrero de su negocio/organización?

_______________ (dólares)

14. ¿Aproximadamente cuántas horas ha gastadó o gastará usted y sus empleados cambiando, reparando, y limpiando las cosas dañadas por las inundaciones de febrero? Por favor tome en cuenta horas gastadas limpiando, comprando materiales de limpiesa o equipo remplasante, instalando equipo remplasante, llenando formas de aseguransa, etc.

______________ (horas)

15. ¿Habia algún vehículo en este edificio dañodo por la inundacion de Febrero?

☐ Sí ☐ No

Si No, prosiga a la Pregunta 18.

16. Cuántos vehiculos que estaban en este edificio fueron dañodos por la inundacion?

____

17. Por favor provea la siguiente informacion a serca de los vehículos en este edificio que fueron dañodos por la inundacion.

a.	Costo total en dólares para reparar o reemplazar vehiculos	__________ (dólares) ☐ marque aquí si no está seguro
b.	Cantidad de reparar o reemplazar de vehiculos cubierta por la aseguransa	__________ (dólares) ☐ marque aquí si no está seguro
c.	Costo de otros gastos relacionados con transportacion causados por la inundacion de Febrero (por ejemplo; caro rentado, transporte público)	__________ (dólares) ☐ marque aquí si no está seguro
d.	Cantidad de gastos relacionados con el transporte cubiertos por la aseguransa	__________ (dólares) ☐ marque aquí si no está seguro

18. ¿En comparación con el primér piso de su edificio, qué tan alto, en pies y pulgadas, alcanzó el nivel de agua?

_____ (pies) _____ (pulgadas) ☐ **por arriba** ☐ **por abajo** **PRIMÉR PISO**
(escoja una)

19. ¿Cuántas horas permaneció el agua en su residencia (sin incluir lodo, residuos que se hayan quedado después que se bajo el nivel de agua)?

_____ (horas)

20. Si existe algo más sobre su inundación que le gustaría hacernos saber, por favor use el espacio siguiente para escribir sus comentarios.

Muchas gracias por completar este questionario. Por favor mande el questionario completo en el sobre pre-pagado o mándelo a la investigadora principal, Dra. Katherine Cushing, a la siquiente dirección: 990 Lundy Lane Los Altos, CA 94024. Se puede quedar con los formularios para su propio expediente.

PARA SU ARCHIVO
¡NO DEVUELVA!

FORMULARIO DE DAÑOS POR LA INUNDACION

NEGOCIOS Y ORGANIZACIÓNES

FORMULARIO DE DAÑOS POR LA INUNDACION:
NEGOCIOS Y ORGANIZACIÓNES

Por favor use estos formularios para describir daños a su edificio y las posesiones de su negocio/organizacion danado por la inundacion de Febrero 1998. Los formularios están organizados en las siguientes categorías: Dano Estructural, dano a contenido, y otro costos relacionados al dano causado por la inundasion.

La informacion que usted provea no tiene que estar absolutamente presisa. Si en dudas, suponga lo mejor que pueda. Despues de completar los formularios 1, 2 y 3, use el "TOTAL" de la informacion en la parte baja de cada formulario para contestar las preguntas 4, 5, y 6 en el questionario. Retenga los formularios para su propio registro. Todo lo que necesitamos que nos envie para atras es el questionario.

Por favor note que su participasion en este estudio es voluntario y en confidencial. Puede rechasar prover Parte o toda la informacion solicitada.

Muchas gracias por su cooperación.

FORMULARIO 1: DAÑO ESTRUCTURAL

	Categoría de Daño	Costo de Reponer y Reparar (incluyendo obrero pagado) (dólares)
1	Trabajo eléctrico (por ejemplo, cableado, interruptores)	
2	Tubería/Plomería (por ejemplo, calentador de agua, agua de la llave, bomba de cisterna, systema antiséptico)	
3	Mecánicos (por ejemplo, calefacción, aire acondicionado)	
4	Puertas y ventanas	
5	Pisos interiores, alfombra, y techos	
6	Paredes, techos, y insulación	
7	Fundación , reparación de roturas	
8	Pintar	
9	Estantes fijos y utensilios	
10	Construcciones externas y garajes	
11	Propiedad externa y jardines	
12	Parqueadero y pasillos externos	
13	Desenbarcadero	
14	Otro	
15	Otro	
16	Otro	
17	Otro	
18	Otro	
	TOTAL	
		Escriba la cantidad en la pregunta 4 del questionario

FORMULARIO 2: DAÑO A CONTENIDOS

	Categoría de Daño	**Costo de Reponer y Reparar (incluyendo obrero pagado) (dólares)**
1	Aparato	
2	Mesa	
3	Lámara	
4	Silla	
5	Sofá	
6	Alfombra/carpeta	
7	Televisor	
8	Equipo de estereo o video	
9	Refrigerador y congelador	
10	Cristelaria	
11	Objetos de plata	
12	Mantelería	
13	Cortinas	
14	China	
15	Casas de muestra, tablero, y cajas	
16	Mercansia	
17	Partes/materiales crudos	
18	Alimientos frescos/alimientos conjelados	
19	Inventorio	
20	Otro	
	TOTAL	
		Escriba la cantidad en la pregunta 5 del questionario

FORMULARIO 3:OTROS COSTOS RELACIONADOS AL DAÑO CAUSADO POR LA INUNDACION

	Categoría de Daño	**Costo (dólares)**
1	Desechar las ruinas y cosas dañadas	
2	Limpieza y desinfectasion	
3	Secando	
4	Repuesta de registros	
5	Costo de operaciones alternatibas	
6	Mover muebles y otras pertenencias	
7	Almacenar muebles y otras pertenencias	
8	Vandalismo, saqueo, o otros robos	
9	Costo médico relacionado con las inundaciones	
10	Otros costos relaciondos con las inundciones	
11	Otro	
12	Otro	
13	Otro	
14	Otro	
15	Otro	
16	Otro	
17	Otro	
18	Otro	
	TOTAL	
		Escriba la cantidad en la pregunta 6 del questionario

APPENDIX C

MUNICIPALITY AND OTHER ORGANIZATIONS INVOLVED IN FLOOD RESPONSE AND RECOVERY EFFORTS—INVESTIGATION METHODOLOGY

In order to obtain relevant information on costs (both direct and indirect) incurred by the municipalities of Palo Alto, East Palo Alto, and Menlo Park, as well as other agencies and organizations involved in flood response and recovery efforts, the following methodology was employed:

1. Identify contacts at municipalities and other organizations
2. Interview contacts to obtain relevant costs information
3. Analyze cost information to identify flood-related costs

This section provides detailed information on the specific procedures followed in implementing these steps.

Step 1. Identify Contacts

The main activity involved in identifying relevant contacts at the various municipal governments and other organizations was attending a set of key meetings where the principal investigator, along with key members of the project team from the Army Corps of Engineers and the Santa Clara Valley Water District, presented information about the purpose and nature of the study. At these meetings, representatives from various organizations affected by the flooding were asked to provide contact information such as telephone number, e-mail address, etc. Table C1. below lists some of the key meetings used to help identify key contacts.

The other major data collection technique used in implementing this step was the "snowball" technique, in which key contacts were interviewed and asked for the names and contact information of others who provide flood cost information. This technique was used to identify contacts in the City of Menlo Park finance and public works department, the City of East Palo Alto's building division, OES and FEMA, and the Red Cross.

Table C1. Key Meetings Used to Identify Contacts

Meeting Description	Date	Contacts Made
San Francisquito Creek Master Plan	September 3, 1998	• City of Palo Alto Public Works staff • City of Menlo Park Environmental Projects Manager • San Francisquito Creek CRMP • SCVWD staff
Economic Impact Study Kick-off Meeting	September 11. 1998	• City of Palo Alto Public Works staff • City of Menlo Park Environmental Projects Manager • City of East Palo Alto Public Works staff • City of Palo Alto Finance staff • City of Palo Alto Planning staff • St. Francis Neighborhood Association • SCVWD staff
CRMP Meeting	September 16, 1998	• CRMP staff • City of Menlo Park • SCVWD • Stanford University

Step 2. Interview Contacts

In this step of the process key contacts were interviewed, in person or by phone, and asked to provide information about costs incurred as a result of the February flooding. Whenever possible, interviewees were asked to provide formal written documentation of costs.

For the municipalities, a key source of data were written documents developed as a result of the city processing a FEMA claim for reimbursement of emergency response and recovery-related activities. For example, Table C2 lists documents collected from the City of Palo Alto that were analyzed and used to develop an estimated of economic impacts for the city. Similar documents were also provided by the city governments of East Palo Alto and Menlo Park.

Table C2. FEMA-related Documents Prepared by the City of Palo Alto

Document Name	Date	Description
"Status Report for All Sites"	February 3, 1999	Location of sites where emergency response or recovery activities took place; cost to city
"Exhibit B" Storm #1203	June 16, 1998	Location of sites and description of activity related to El Nino storm; cost estimate of activity
Damage Survey Reports (DSRs)	Several, dated June through October 1998	Detailed descriptions of individual activities related to El Nino storm; detailed cost breakdown of activity

Other written documents that served as important sources of information included City Manager's Reports, correspondence between the cities and OES/FEMA officials, and publicly available FEMA publications.

Other data needed for the study was not specifically contained in written documents. For example, regular time ("straight time") spent by staff in response to flood response and recovery activities was not kept track of by city finance staff. The reason for this was that this category of expenses is not reimbursable by OES/FEMA. Therefore, in order to capture this information for the municipalities, the principal investigator needed to speak with finance staff and explain to them the type of payroll information she wanted to collect. Similarly, economic impacts such as "lost productivity" and "lost fees" were not accounted for in any pre-prepared documents. To obtain information, it was necessary to collect whatever information that related on the general cost category and determine how that information reflected direct or indirect costs of the flood. For example, general payroll information on time spent dealing with the 1998 El Nino storm was collected for the City of Palo Alto, but these costs were not separated according to flooding versus more general storm-related activities. The way this kind of data was handled is discussed in explanation of the next step.

Step 3. Analyze Cost Information

The final step in conduct this part of the study involved analyzing the data collected and determining which costs could be included in the study. The scope of the investigation was limited—it focused primarily on damages incurred within the municipal boundaries of Palo Alto, East Palo Alto, and Menlo Park. It did not include damage due to erosion or to localized flooding (e.g., storm drain back-up).

The operating criteria used to determine the relevance of costs to this investigation was the following: "Did this damage occur because of creek waters overflowing?" Much of the documentation provided by the municipalities did not make this distinction. Moreover, their cost categories included all activities related to the larger event of the El Nino storms that occurred throughout the month of February, and not specifically on the flooding of the creek. With these constraints in mind, the principal investigator with assistance from technical staff at the SCVWD and staff at the cities of Palo Alto, Menlo Park, and East Palo Alto, identified those activities thought to be due all or mostly to the flooding. Table C3 lists examples of costs incurred as a result of the storm, but were not included in this investigation's cost calculations.

Table C3. Examples of Activities Not Included in Cost Calculations

Description	Amount
Palo Alto	
- Damage to Arastradero Preserve	$34,488
- Damage to Los Trancos Road	$37,703
- Damage to Foothills Park	$11,601
- Damage to community center	$428,450
East Palo Alto	
- Repair to community center	$16,224
Menlo Park	
- Damage to storm drain	$3,190

Other flood-related costs required estimation on the principal investigator's part. For example, variables such as the portion of El Nino storm staff costs attributable to the San Francisquito Creek flood and determining lost building permit fees based on building permit application forms were estimated.

Note Regarding Methodology

All in all, this methodology was effective—the majority of organizations contacted for this part of the study had relevant information and were willing to share it. However, collecting information for some organizations, particularly the Red Cross, proved difficult. Part of this difficulty stemmed from the length of time that had passed between the flood event the onset of data collection. Another reason why it was difficult to collect information from this organization was related to Red Cross' general record keeping procedures. According to data from interviews conducted with Red Cross staff at the local, regional, and national levels, much of the data collected during and after a disaster event is aggregated at the national level, and then destroyed. Therefore, when staff was asked to provide specific information about the San Francisquito Creek flooding (as opposed to the El Nino storms), they were unable to disaggregate the data. Furthermore, the confidentiality of some documents prepared by Red Cross staff was confidential, and staff was unable to release information for the purposes of this study. Finally, it was difficult to identify a key contact person. The principal investigator encountered a considerable amount of "red tape" in attempting to identify who the proper contact might be.

In future similar studies, there are two suggestions for reducing the probability of this occurring again. First, additional scoping could be done during the early stages of the project to ensure representation of more organizations at key meetings. If the key contact is identified successfully early on, chances of obtaining the needed information will be better. Second, the post-event investigation could be initiated closer to the time the event actually occurred.

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